

---

# The 2001 International Piping Plover Census in Canada

---

**Diane L. Amirault (editor)**

---

Atlantic Region 2005  
Canadian Wildlife Service  
Environment Conservation Branch

---

Technical Report Series Number 436

---



Environment  
Canada

Environnement  
Canada

Canadian Wildlife  
Service

Service canadien  
de la faune

Canada

## TECHNICAL REPORT SERIES CANADIAN WILDLIFE SERVICE

This series of reports, established in 1986, contains technical and scientific information from projects of the Canadian Wildlife Service. The reports are intended to make available material that either is of interest to a limited audience or is too extensive to be accommodated in scientific journals or in existing CWS series.

Demand for these Technical Reports is usually confined to specialists in the fields concerned.

Consequently, they are produced regionally and in small quantities; they can be obtained only from the address given on the back of the title page. However, they are numbered nationally. The recommended citation appears on the title page.

Technical Reports are available in CWS libraries and are listed in the catalogue of the National Library of Canada in scientific libraries across Canada. They are printed in the official language chosen by the author to meet the language preference of the likely audience, with a résumé in the second official language. **To determine whether there is significant demand for making the reports available in the second official language, CWS invites users to specify their official language preference. Requests for Technical Reports in the second official language should be sent to the address on the back of the title page.**

## SÉRIE DE RAPPORTS TECHNIQUES DU SERVICE CANADIEN DE LA FAUNE

Cette série de rapports donnant des informations scientifiques et techniques sur les projets du Service canadien de la faune (SCF) a démarré en 1986. L'objet de ces rapports est de promouvoir la diffusion d'études s'adressant à un public restreint ou trop volumineuses pour paraître dans une revue scientifique ou l'une des séries du SCF.

Ordinairement, seuls les spécialistes des sujets traités demandent ces rapports techniques. Ces documents ne sont donc produits qu'à l'échelon régional et en quantités limitées; ils ne peuvent être obtenus qu'à l'adresse figurant au dos de la page titre. Cependant, leur numérotage est effectué à l'échelle nationale. La citation recommandée apparaît à la page titre.

Ces rapports se trouvent dans les bibliothèques du SCF et figurent aussi dans la liste de la Bibliothèque nationale du Canada utilisée dans les principales bibliothèques scientifiques du Canada. Ils sont publiés dans la langue officielle choisie par l'auteur en fonction du public visé, avec un résumé dans la deuxième langue officielle. **En vue de déterminer si la demande est suffisamment importante pour produire ces rapports dans la deuxième langue officielle, le SCF invite les usagers à lui indiquer leur langue officielle préférée. Il faut envoyer les demandes de rapports techniques dans la deuxième langue officielle à l'adresse indiquée au verso de la page titre.**



This document is  
printed on EcoLogo<sup>®</sup>  
certified paper.

**THE 2001 INTERNATIONAL  
PIPING PLOVER CENSUS  
IN CANADA**

**DIANE L. AMIRAULT (Editor)**  
Canadian Wildlife Service  
P.O. Box 6227  
Sackville, New Brunswick  
E4L 1G6

**Technical Report Series No. 436  
Canadian Wildlife Service  
Atlantic Region**

**April 2005**

This report may be cited as:

Amirault, D.L. (editor). 2005. The 2001 International Piping Plover Census in Canada. Technical Report Series No. 436. Canadian Wildlife Service, Atlantic Region. 126pp.

Published under the Authority of the  
Minister of Environment  
Canadian Wildlife Service

© Her Majesty the Queen in Right of Canada, represented by the Minister of Environment, 2005.  
Catalogue No. CW69-5/436E  
ISBN 0-662-40333-9

Copies may be obtained from:

Diane Amirault  
Canadian Wildlife Service  
17 Waterfowl Lane,  
Sackville, N.B.  
E4L 1G6

Phone: 506-364-5060  
Fax: 506-364-5062  
e-mail: [diane.amirault@ec.gc.ca](mailto:diane.amirault@ec.gc.ca)





This publication is dedicated to the memory of Colin Stewart and Peter McIntyre.  
These individuals exemplified commitment to Piping Plover conservation.  
Colin was instrumental in the establishment of the early Nova Scotia Guardian Program that  
continues today; later on he focused his efforts on the recovery team.  
Peter was a tireless worker, spending long days in the field implementing important conservation  
and education programs for the Prince Edward Island Nature Trust.  
Their contributions are not forgotten.



## Abstract

The third North America-wide census of breeding and wintering Piping Plover (*Charadrius melodus*) was conducted between June 3 and June 16, 2001. The North America breeding population was estimated at 5945 adults (2747 pairs); a slight increase from 1996 (+14 adults).

The breeding population count in Canada was estimated to be 1454 adults (496 pairs), approximately 24 % of the North American total. Canadian numbers were down 31 % from the 1996 count (-653 adults).

In Eastern Canada, 481 adults including 217 breeding pairs were observed during the census. The distribution was 39 adults in Newfoundland and Labrador, 93 in Nova Scotia, 112 in Prince Edward Island, 167 in New Brunswick and 70 in Quebec (Îles de la Madeleine). In addition, 9 adults were observed in St. Pierre et Miquelon (France). Only Quebec reported a decline (-34 adults) between 1996 and 2001. Overall, in 2001 there were 59 more adult Piping Plovers compared to 1996, however this was still below the 1991 count of 509, and was less than the recovery target of 670 adults and 335 pairs.

In Ontario and prairie Canada, 973 adults (279 pairs) were counted, 2 adults in Ontario, 16 in Manitoba, 805 in Saskatchewan and 150 in

Alberta. A considerable decline was observed between 1996 and 2001 (-715 adults) and 2001 numbers were down from the 1991 estimate (-464 adults). Much of the decline was attributed to the loss of 543 birds in Saskatchewan, but all provinces reported fewer birds. The population recovery objective of 1626 adults (813 pairs) was not reached.

Monitoring and protection efforts to reduce disturbances to Piping Plovers and their habitats have expanded nation-wide since the previous survey. The population increase observed in Eastern Canada was likely a result of increased protection and recovery efforts including use of predator exclosures and extensive public outreach. The decline observed in Prairie Canada was severe and strongly linked to a decrease in habitat availability and quality.

Data collected during the International Census is essential to evaluate progress made towards achieving population goals. To date, population recovery targets have not yet been met for the Canadian populations, but a much greater understanding of the threats to survival and recovery of this species has been achieved. Evaluating population status over the breeding distribution also permits changes in distribution and local abundance to be noted.

## Résumé

Le troisième recensement nord-américain des populations de Pluviers siffleurs (*Charadrius melodus*) a eu lieu entre 3 juin et 16 juin, 2001. La population nicheuse de l'Amérique du Nord a été estimée à 5 945 adultes (2 747 couples), ce qui représente un léger accroissement par rapport à 1996 (+14 adultes).

Le Canada compte une population nicheuse estimée à 1 454 adultes (496 couples), soit environ 24 % du total pour l'Amérique du Nord. Ce chiffre représente une baisse de 31% par rapport à celui de 1996 (-653 adultes).

Dans l'Est du Canada, 481 adultes (217 couples nicheurs) ont été observés pendant le recensement. Les adultes nombraient 39 à Terre-Neuve-et-Labrador, 93 en Nouvelle-Écosse, 112 à l'Île-du-Prince-Édouard, 167 au Nouveau-Brunswick et 70 au Québec (Îles-de-la-Madeleine). De plus, neuf adultes ont été observés à Saint-Pierre-et-Miquelon (France). Le Québec est le seul endroit où une baisse a été enregistrée (-34 adultes) de 1996 à 2001. Dans l'ensemble, les recenseurs ont noté une augmentation (+59 adultes) du nombre de pluviers dans l'Est du Canada entre 1996 et 2001; cependant, les chiffres enregistrés n'ont pas atteint l'estimation établie en 1991 (509 adultes) et sont demeurés en deçà de l'objectif de rétablissement (670 adultes et 335 couples).

En Ontario et dans les Prairies canadiennes, les recenseurs ont dénombré 973 adultes (279 couples): deux adultes en Ontario, 16 au Manitoba, 805 en Saskatchewan et 150 en Alberta. Une baisse considérable a été enregistrée par rapport à 1996

(-715 adultes) et à 1991 (-464 adultes). Cette réduction est en grande partie attribuée à la perte de 543 oiseaux en Saskatchewan, même si les autres provinces ont elles aussi signalé une régression de leurs populations. L'objectif de rétablissement, qui se chiffre à 1 626 adultes (813 couples), n'a pas été atteint.

Depuis le dernier recensement, les travaux de surveillance et de protection entrepris en vue de réduire les perturbations de l'espèce et de son habitat se sont multipliés partout au pays. La croissance démographique observée dans l'Est du Canada était probablement due à l'intensification des mesures de protection et des efforts de rétablissement, notamment la pose d'exclos pour faire obstacle aux prédateurs et la mise sur pied de vastes programmes de sensibilisation du public. La baisse appréciable observée dans les Prairies était étroitement liée à une réduction de la superficie et de la qualité de l'habitat disponible.

Les données recueillies pendant le recensement international jouent un rôle essentiel. Elles permettent d'évaluer les mesures de rétablissement et de cerner les secteurs où il importe de redoubler d'effort. Jusqu'à présent, les objectifs de rétablissement n'ont pas été atteints au Canada, mais les chercheurs comprennent beaucoup mieux les facteurs qui menacent la survie et le rétablissement de l'espèce. L'évaluation du statut de la population à travers les aires de nidification permet de noter des changements à la distribution et à l'abondance régionale.

## Acknowledgements

Thanks are extended to the Canadian census coordinators for their contribution in planning, implementing and compiling results of the census. The coordinators were: Diane Amirault, Joe Brazil, Lori Dunlop, Roger Etcheberry, Leo Heyens, Bill Koonz, Pamela Mills, Dave Prescott, François Shaffer and Jackie Waddell.

Completion of the 2001 International Piping Plover census would not have been possible without the contributions of many federal and provincial agencies, non-governmental organizations and volunteers who ensured that all potential sites were visited within the census period.

The many authors of chapters contained within this report provided their time and effort to ensure that results from their respective jurisdictions could be shared.

Thanks are extended to members of the International Piping Plover Coordination Group for their proficiency in planning, coordinating and implementing the International Census. Members of this group are: Dr. Susan Haig (Coordinator), Nell McPhillips, Jack Dingledine, Diane Amirault, Paul Goossen and Anne Hecht. Cheron Ferland and Dr. Susan Haig provided the exceptional leadership necessary to make the census reporting a success. Dr. Haig (U.S. Geological Survey) also kindly provided the distribution maps contained within this report.

Technical and editorial assistance were provided by Krista Baker, Amy Marsters, Julie McKnight and Jennifer Stewart. Without their assistance, this report would not have been possible. Paul Goossen provided valuable input and advice for completing this document.

To all those who contributed to the completion of the 2001 International Census survey and report, I express my sincere gratitude for their dedication. Funding for the census was provided by various organizations identified throughout this report.

## Contents

Abstract.....	iv
Résumé.....	v
Acknowledgements.....	vi
Table of Contents.....	vii
Figures.....	ix

Introduction to 2001 Census .....	1
<i>J.P. Goossen</i>	

### EASTERN CANADA

The 2001 Piping Plover Census in Newfoundland and Labrador and St. Pierre et Miquelon (France) <i>P. Thomas and R. Etcheberry</i> .....	3
The 2001 Piping Plover census in Nova Scotia <i>J. McKnight</i> .....	10
The 2001 Piping Plover census in Prince Edward Island <i>J. Waddell</i> .....	28
The 2001 Piping Plover census in New Brunswick <i>D.L. Amirault and J. McKnight</i> .....	41
Recensement international du Pluvier siffleur au Québec, en 2001 <i>F. Shaffer</i> .....	53

### GREAT LAKES

The 2001 Piping Plover census in Ontario <i>L.E. Heyens</i> .....	61
--	----

### PRAIRIES

The 2001 Piping Plover census in Manitoba <i>J. Stewart and K. DeSmet</i> .....	69
The 2001 Piping Plover census in Saskatchewan <i>L. Dunlop</i> .....	75

## Contents (cont.)

### PRAIRIES (CONT.)

---

The 2001 Piping Plover census in Alberta <i>D.R.C. Prescott</i> .....	95
<b>Conservation of the Piping Plover in Canada</b> <i>D.L. Amirault</i> .....	111
<b>Literature cited</b> .....	115
<b>Appendix 1:</b> 2001 International Piping Plover Breeding Census Guidelines and Individual Census Report...	122

## Figures

### EASTERN CANADA

---

#### NEWFOUNDLAND AND ST. PIERRE ET MIQUELON

Figure 1: Distribution of Piping Plover in Newfoundland during 2001 census.....	6
Figure 2: Distribution of Piping Plover in St. Pierre et Miquelon during 2001 census.....	7

#### NOVA SCOTIA

Figure 1: Distribution of Piping Plover in Nova Scotia during 2001 census.....	15
Figure 2: Piping Plover pair and productivity estimates in Nova Scotia, 1996 to 2001.....	27

#### PRINCE EDWARD ISLAND

Figure 1: Distribution of Piping Plover in Prince Edward Island during 2001 census.....	35
Figure 2: Proportion and distribution of Piping Plovers in PEI, 1991 to 2001.....	40

#### NEW BRUNSWICK

Figure 1: Distribution of Piping Plover in New Brunswick during 2001 census.....	45
--	----

#### QUÉBEC

Figure 1: La distribution du Pluvier siffleur au Québec pendant le recensement de 2001.....	56
---	----

### GREAT LAKES

---

#### ONTARIO

Figure 1: Distribution of Piping Plover in Ontario during 2001 census.....	65
--	----

### PRAIRIES

---

#### MANITOBA

Figure 1: Distribution of Piping Plover in Manitoba during 2001 census .....	73
--	----

SASKATCHEWAN

Figure 1: Distribution of Piping Plover in Saskatchewan during 2001 census.....	81
Figure 2: Distribution of Piping Plover in Saskatchewan during 2001 census (inset).....	82

ALBERTA

Figure 1: Distribution of Piping Plover in Alberta during 2001 census.....	100
Figure 2: Piping Plover population decline on Alberta Lakes, 1986-2001... ..	110



## Introduction to 2001 Census

J. Paul Goossen

Canadian Wildlife Service, Prairie and Northern Region, Room 200, 4999-98 Avenue, Edmonton, Alberta T6B 2X3

The Piping Plover (*Charadrius melodus*) is an endemic shorebird to North America. It breeds on open beaches, sand flats and alkali flats in the Atlantic, Great Lake and Prairie Regions of the continent (Haig 1992).

Chick and egg depredation, habitat loss or alteration (i.e. erosion and water level rise) and human disturbance through recreational beach use have contributed to the population decline of the species (Haig 1992; Goossen *et al.* 2002). The Piping Plover was listed as endangered in 1985 by COSEWIC (Committee on the Status of Endangered Wildlife in Canada) (Haig 1985). In May 2001 the species was re-examined and split into groups according to subspecies. Both Piping Plover subspecies, *Charadrius melodus melodus* (Atlantic Region) and *Charadrius melodus circumcinctus* (Prairies) were listed separately as endangered (Boyne 2001).

Wildlife conservationists, government wildlife agencies and nongovernmental organizations require population data to assess the status, abundance, and distribution of species for a variety of reasons including: stewardship responsibilities, mandates, program justification and local, national, and international commitments. Numerous variables hinder the collection of accurate counts of bird species; however, species with small populations and known distributions are more readily counted than those with large populations whose distributions are unknown or broad. Habitat type and accessibility, as well as the experience, skill and patience of observers (particularly if inexperienced volunteers are recruited) are all factors that may affect the precision of population counts.

Numerous shorebird counts have been carried out in North, Central, and South America (see Morrison and Ross 1989; Morrison *et al.* 1993). Shorebirds tend to be easier to count than other species such as songbirds, for example, because they tend to migrate/stage in flocks and are found in relatively open habitats. The difficulty in attaining accurate counts for most shorebirds is their wide distribution and generally high population levels (Morrison *et al.* 2001).

The biological characteristics of the Piping Plover on its breeding grounds such as its highly territorial nature, tendency for both sexes to incubate eggs continuously, and defined habitat requirements have led biologists to be most confident in the accuracy of Piping Plover population counts on the breeding grounds. The global population estimate, breeding range and breeding distribution are probably the most accurately known of all Western Hemispheric shorebirds. Numerous surveys, environmental assessments, research and management projects have facilitated this high level of confidence in population estimates, breeding range and breeding distribution of this species. The wintering grounds are however a greater challenge because not all wintering sites have been documented and access to some is difficult or nearly impossible. Numbers counted on the wintering ground are typically 40-63% of those from the breeding grounds indicating that significant Piping Plover wintering areas continue to be overlooked (Haig *et al.* in prep.; Haig and Plissner 1993).

The 1991 International Census was the first comprehensive count of Piping Plovers on both breeding and wintering grounds and produced the first global population estimate (5482) for the species (Haig and Plissner 1993). This count confirmed that the Piping Plover has the smallest population of any regularly breeding shorebird in continental North America, except perhaps for the Wilson's Plover (*Charadrius wilsonia*) whose population is estimated to be 6000 and the Eskimo Curlew (*Numenius borealis*) which may now be extinct (Morrison *et al.* 2001). The 1991 census also provided additional justification for the status designations assigned to the species in both Canada and the United States. The

second and third censuses confirmed the global population at approximately 6000 adults spread out over three geographical breeding ranges, and reaffirmed the complexity and diversity of potential threats to survival (Plissner and Haig 2000; Ferland and Haig 2002).

In 2001, the third International Piping Plover Census was carried out in Canada, United States, Mexico, Cuba, Bahamas and several Caribbean islands (Ferland and Haig 2002). The data for this census allowed for a third population estimate and assessment of population change. Results from the three censuses show that the Northern Great Plains population is in decline while the Great Lakes and U. S. Atlantic populations are increasing. The efforts of thousands of individuals have assisted in the conservation of this species. Numbers from Atlantic Canada are more variable and have yet to return to 1991 levels. Although the three censuses have occurred within an 11- year range, more counts are required to clearly assess population trends for the Piping Plover.

The accuracy of Piping Plover censuses has been questioned. Researchers know that Piping Plovers can be difficult to locate because of their cryptic colouration and their remarkable mobility in dynamic habitats. The potential for double counting is a factor, as is the concern that all wetlands and beach sites where Piping Plovers breed have not been discovered. The challenge for researchers is to determine what proportion of the population is missed on these censuses. Piping Plover biologists do not believe that significant numbers of birds are being missed because in most regions greater efforts in each succeeding census and increased experience gained by censusers has not resulted in significantly greater Piping Plover numbers on international censuses. There will likely always be some Piping Plovers that are missed during international censuses, however this number is thought to be fairly small. Survey efforts on prairie wetlands and coastal beaches must continue to determine whether Piping Plovers occur at previously undocumented sites. These activities will result in better census coverage and refinement of the known Piping Plover distribution.

Herein are the results from the third International Piping Plover Census conducted in 2001. The purpose of this report is to document population estimates and trends of Piping Plovers in Canada and to highlight the continuing efforts of many agencies and people that help in the recovery of this species at risk. This report provides an opportunity to complete more comprehensive analyses of trends, more fully evaluate and identify research needs, recovery and conservation efforts than otherwise described in journal publications or international reports of these censuses (Plissner and Haig 2000).

## The 2001 Piping Plover Census in Newfoundland and Labrador and St. Pierre et Miquelon (France)

Peter Thomas<sup>1</sup> and Roger Etcheberry<sup>2</sup>

<sup>1</sup>Canadian Wildlife Service, 6 Bruce Street, Mount Pearl, NL A1N 4T3

<sup>2</sup>B.P. 328, St-Pierre, Îles St-Pierre et Miquelon, France

### Abstract

As part of the 2001 International Piping Plover Census, 43 potential Piping Plover beaches were surveyed by 15 volunteers on insular Newfoundland and the French Islands of St. Pierre et Miquelon. In total, 48 Piping Plovers (39 in Newfoundland and Labrador and nine on St. Pierre et Miquelon) were recorded, constituting the largest count of Piping Plovers for this area. Key Piping Plover locations continue to be in the southwest corner of Newfoundland, including Sandy Point/ Flat Bay, Grand Bay West to J. T. Cheeseman Provincial Park Beach, and Big Barasway along the south coast. Although the population has increased from the 1996 International Census estimate of 36 Piping Plovers (27 in Newfoundland and six in St. Pierre et Miquelon), concern still remains for the future conservation of the species (Brazil *et al.* 1996).

### Résumé

Dans le cadre du recensement international de 2001, un groupe de 15 bénévoles a surveillé 43 plages susceptibles de servir d'habitat au Pluvier siffleur dans l'île de Terre-Neuve et dans l'archipel français de Saint-Pierre-et-Miquelon. Les recenseurs y ont compté 48 individus (39 au Terre-Neuve et neuf à Saint-Pierre-et-Miquelon), soit le plus grand nombre jamais dénombré dans cette région. Les principaux habitats du Pluvier siffleur demeurent l'extrémité sud-ouest de Terre-Neuve, y compris Sandy Point/Flat Bay, le secteur s'étendant de Grand Bay West à la plage du parc provincial J. T. Cheeseman ainsi que Big Barasway, le long de la côte Sud. Malgré cette croissance démographique, la survie de l'espèce continue de susciter des inquiétudes (Brazil *et al.* 1996).

### Introduction

There is little historical information on Piping Plovers (*Charadrius melodus melodus*) in Newfoundland and Labrador. Surveys were not initiated in the Province until the mid to late 1980s, and they were limited to a few areas. Piping Plovers once bred along the northeast coast of Newfoundland but have not been observed in that area since the late 1980s. Subsequently, their range in Newfoundland and Labrador has been limited to the southwest coast of insular Newfoundland, consisting of approximately 260 km of linear coastline. The French island, Miquelon, also hosts a small population of Piping Plovers, but they are not a protected species in France.

Here, the 2001 Newfoundland and Labrador, and St. Pierre et Miquelon Piping Plover censuses are described, and the results are compared to previous International Censuses (1991 and 1996). Lastly, a brief overview is provided on the status of the Piping Plover in Newfoundland and Labrador and the threats presently faced by the population.

## Methods

Twelve volunteers surveyed six regions (39 beaches) of insular Newfoundland for Piping Plovers. Four additional beaches were surveyed in St. Pierre et Miquelon by three volunteers. The Newfoundland and Labrador surveys were organised by the Canadian Wildlife Service and the Inland Fish and Wildlife Division of the provincial government. Roger Etcheberry organised the surveys in St. Pierre et Miquelon.

Surveys in Newfoundland and Labrador were conducted between 04–20 June at historical and potential Piping Plover beaches. The St. Pierre et Miquelon surveys were conducted between 11 - 19 June at sites with past Piping Plover presence and at otherwise favourable sites. All survey counts were completed according to the International Census Protocol (Haig and Plissner 1993). Survey times varied by location, however surveys were not completed in unfavourable weather conditions. Number of surveyors per site ranged from one to five depending upon location, however an experienced surveyor was present at each beach. All surveys were conducted by foot (Haig and Plissner 1992; Haig and Plissner 1993).

## Results

Thirty-nine beaches in six regions of insular Newfoundland were surveyed for Piping Plovers in 2001 (Table 1). Piping Plovers were found in three regions (Figure 1). More sites were surveyed than during previous International Censuses. Twenty-five beaches were surveyed during the 1996 census while only 11 beaches were included in the 1991 census. Approximately 71.4 km of beach was surveyed in 2001, nearly double the linear habitat searched in 1991.

A total of 39 individual Piping Plovers were counted on insular Newfoundland beaches in 2001. This was an increase from seven individuals in 1991, and 27 individuals in 1996. Although all regions had appropriate habitat, many sites were deteriorated and altered due to local land use practices and some beaches were unsuitable for nesting Piping Plovers. Nine adults were observed on the four beaches surveyed on the French Islands of St. Pierre et Miquelon. This is an increase from four individuals observed in 1991, and six individuals counted in 1996.

## Discussion

Although the number of Piping Plovers observed during the 2001 International Census suggests a large increase of Piping Plovers in Newfoundland and Labrador as well as St. Pierre et Miquelon, survey effort and skill level of the surveyors has increased considerably since 1991. Piping Plover trends in Newfoundland are probably best assessed by analysing the data from three key locations for Piping Plovers on insular Newfoundland: Flat Bay/ Sandy Point, J. T. Cheeseman Park Beach, and Big Barasway Beach (Figure 1), where survey effort and detection probability has remained relatively constant. Results from these locations indicate a decline at two of the three locations since 1996 (Table 2). A decrease in the number of adults at these locations may have long term consequences for the conservation and recovery of this species in Newfoundland and Labrador.

Reduced numbers at key locations may be linked with increased anthropogenic disturbances such as all-terrain vehicles (ATVs). The "capelin roll" may also have negatively affected the success of Piping Plovers in past years. Capelins (*Mallotus villosus*) are related to freshwater smelt and move inshore to breed. They often roll onto beaches during the spawning process, attracting many predators in the process. An abundance of capelin on the beaches may have indirectly negatively impacted Piping Plovers

by increasing the number of predators on the beach. The "capelin roll" in 2001 and 2002 coincided with Piping Plover incubation periods.

No Piping Plovers were observed in the northeast section of the province, as in 1991 and 1996. Surveys in the 1980s indicated breeding Piping Plovers in the northeast region of Newfoundland constituting the most northern breeders in eastern Canada. Surveys of these beaches in 2001 indicated a high level of ATV activity in addition to sand removal practices in some areas. Illegal hunting of various shorebird species is known to occur in this area (K. Tucker pers. comm.). Despite such disturbances, the physical characteristics of habitat in this area of the province still appear capable of supporting breeding Piping Plovers.

Notwithstanding the absence of Piping Plovers in the northeast, the 2001 Newfoundland Piping Plover population was the largest in recorded history due to increased survey effort and efficiency. We are hopeful that their numbers will continue to improve as education programs and beach guardian presence increases at key locations.

St. Pierre et Miquelon experienced their highest Piping Plover count on record. This is the first year that Piping Plovers have nested at the relatively inaccessible site on the northeast side of the Gully of Grand Barachois. This site offers viable nesting habitat with little anthropogenic disturbance. There are high levels of predator and human activity at the Gully of Grand Barachois site. However, despite the presence of multiple predators, and vehicular disturbance, the pair at this site hatched and successfully fledged 3 chicks.

The Canadian Wildlife Service has been conducting a mark-recapture study of the Piping Plover in Atlantic Canada since 1998. The program was initiated in Newfoundland in the same year. Through this effort, we have learned that Newfoundland is recruiting young breeding Piping Plovers from other regions within the Gulf of St. Lawrence. Breeding Piping Plovers have been observed or recaptured in Newfoundland that were originally banded as chicks in Prince Edward Island, New Brunswick, and the Magdalen Islands (Amirault 2001). This is a significant discovery, as it illustrates that the Newfoundland population is part of a larger Gulf of St. Lawrence metapopulation.

### **Acknowledgements**

I would like to thank all participants in the 2001 International Piping Plover Census in both insular Newfoundland and St. Pierre et Miquelon: Joe Brazil, Leah Soper, Michael Bennett, Lorna Lafosse, Janelle Hancock, Shawn Avery, Corinne Wilkerson, Dan Myers, Siân French, Eugene Ball, Lin Penney, and Jeff Dewland. In St. Pierre et Miquelon, Danielle Lebollocq and Laurent Jackman provided assistance in completing the census.

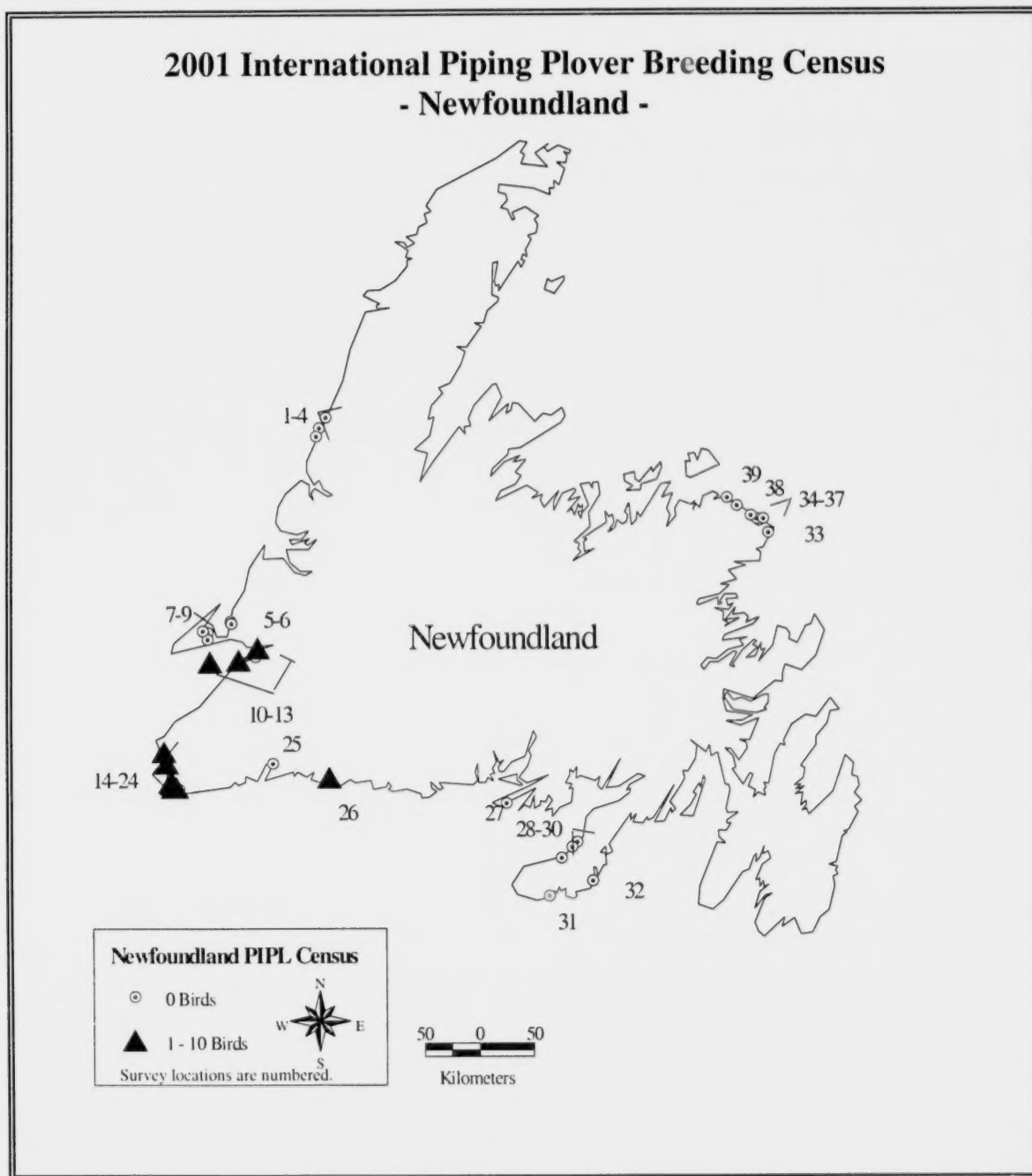


Figure 1. Distribution of Piping Plover in Newfoundland during 2001 census.



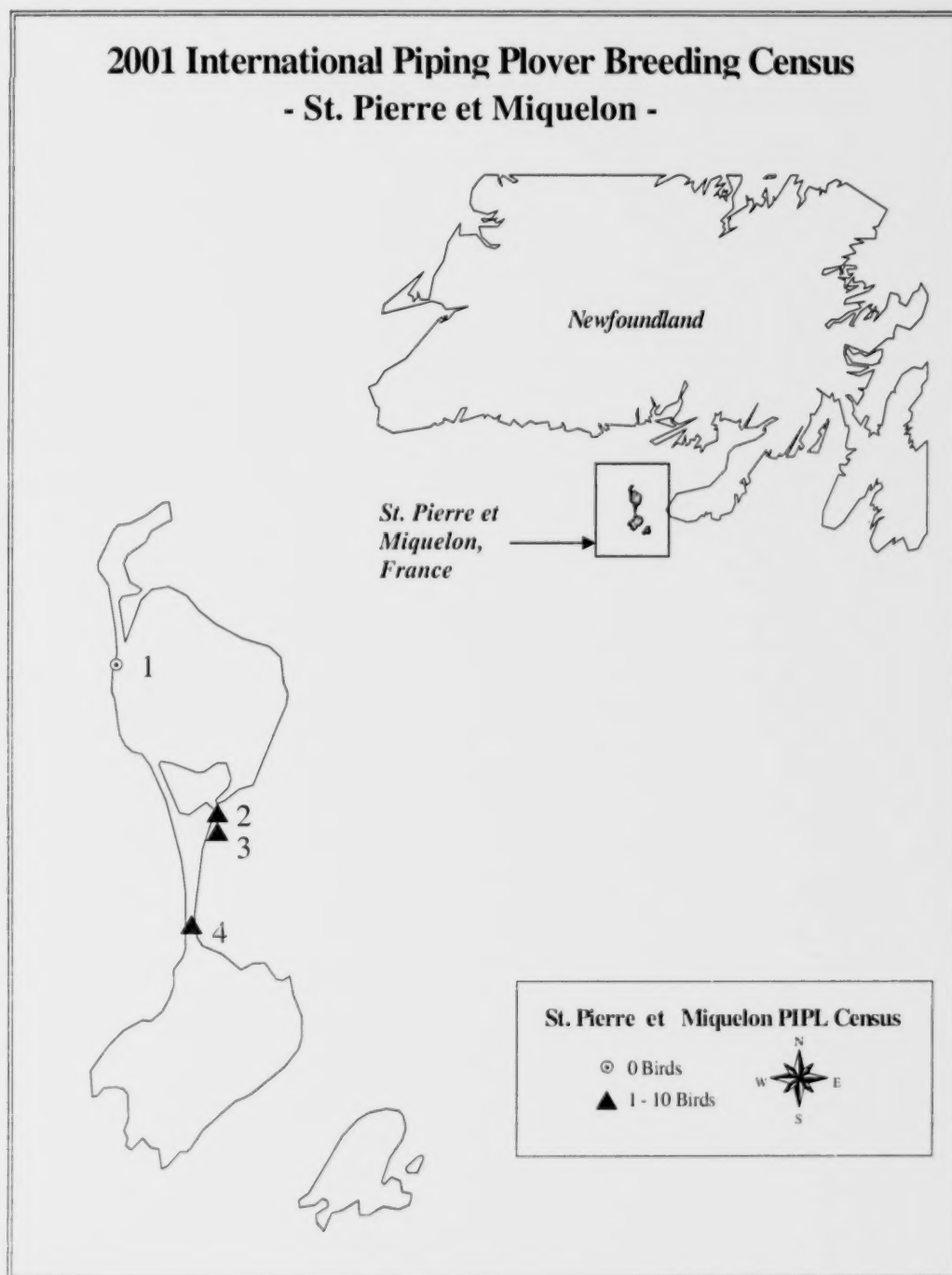


Figure 2. Distribution of Piping Plover in St. Pierre et Miquelon during 2001 census.

Table 1. Results of International Piping Plover Census Efforts in Newfoundland and St. Pierre et Miquelon (France), 1991, 1996 &amp; 2001

Map #	Site	Location	1:50,000 NTS Map Sheet	Date	No. pairs	No. adults	2001 census		91 census	96 census
							No. of Observer s	distance covered (km)		
25	Bakers Spit	Newfoundland	11 O/16	12-Jun	0	0	2	0.9	-	0
21	Big Barachois	Newfoundland	11 O/11	11-Jun	1	2	3	2	-	2
26	Big Barasway	Newfoundland	11 P/12	8-Jun	1	3	2	5	7	5
1	Broom Pt.	Newfoundland	12 H/13	12-Jun	0	0	2	2.1	-	0
33	Cape Freels	Newfoundland	2 F/03	11-Jun	0	0	4	2.8	0	0
36	Deadmans Bay	Newfoundland	2 F/05	12-Jun	0	0	2	2.9	0	0
13	Flat Bay	Newfoundland	12 B/07	6-Jun	3	7	3	3.8	-	-
5	Fox Island River	Newfoundland	12 B/10	13-Jun	0	0	2	0.7	-	-
29	Frenchmans Cove	Newfoundland	1 M/03	5-Jun	0	0	2	2	-	-
28	Garnish	Newfoundland	1 M/03	5-Jun	0	0	2	1.1	-	-
22	Grand Bay West Beach	Newfoundland	11 O/11	11-Jun	0	0	3	0.4	-	0
30	Grand Beach	Newfoundland	1 M/03	4-Jun	0	0	2	4.5	-	-
14	Grand Codroy Park	Newfoundland	11 O/14	3-Jun	0	0	2	1.5	0	2
19	J. T. Cheeseman Park	Newfoundland	11 O/11	12-Jun	2	5	3	2.7	-	10
24	Kelby Cove	Newfoundland	11 O/11	11-Jun	0	0	3	0.5	-	0
32	L'anse au Loup	Newfoundland	1 M/04	4-Jun	0	0	2	1.8	-	-
11	Little Barachois	Newfoundland	12 B/08	14-Jun	0	0	1	0.2	-	-
16	Little Codroy Beach	Newfoundland	11 O/14	3-Jun	2	4	3	3	-	0
34	Lumsden Head E.	Newfoundland	2 F/05	11-Jun	0	0	4	2	0	0
37	Lumsden Head W.	Newfoundland	2 F/05	11-Jun	0	0	4	1.7	0	0
39	Musgrave Harbour	Newfoundland	2 F/05	12-Jun	0	0	2	1.7	0	0
17	Osmond Beach	Newfoundland	11 O/11	11-Jun	1	2	3	0.7	-	0
8	Piccadilly	Newfoundland	12 B/10	8-Jun	0	0	2	0.5	-	-
9	Piccadilly Head Beach	Newfoundland	12 B/10	7-Jun	0	0	2	0.9	-	-
6	Point au Mal	Newfoundland	12 B/10	7-Jun	0	0	2	2.6	-	-
18	Rocky Barachois	Newfoundland	11 O/11	11-Jun	1	5	3	0.7	-	5
20	Rocky Barachois Bight	Newfoundland	11 O/11	11-Jun	0	1	3	1.3	-	2



Table 1. Results of International Piping Plover Breeding Census in Newfoundland and St. Pierre et Miquelon (France), 1991, 1996 &amp; 2001 (cont.)

Map #	Site	Location	1:50,000 NTS Map Sheet	Date	No. pairs	No. adults	2001 census		91 census	96 census
							No. of Observer s	distance covered (km)		
31	Sandy Cove Head	Newfoundland	11 O/09	4-Jun	0	0	2	0.3	-	-
12	Sandy Point	Newfoundland	12 B/08	nr	0	3	3	2.3	0	1
27	Seal Cove Beach	Newfoundland	11 P/08	13-Jun	0	0	4	2.4	-	-
15	Scarston Beach	Newfoundland	11 O/14	6-Jun	1	2	2	0.5	-	0
4	Shallow Bay	Newfoundland	12 H/13	12-Jun	0	0	2	3.1	0	0
38	Shalloway Bay	Newfoundland	2 F/05	12-Jun	0	0	2	1	-	0
23	Short Sand Beach	Newfoundland	11 O/11	11-Jun	1	2	3	0.7	-	0
2	St. Pauls	Newfoundland	12 H/13	12-Jun	0	0	2	2	-	0
10	Stephenville Crossing	Newfoundland	12 B/08	8-Jun	1	3	2	2.7	0	0
7	West Bay Beach	Newfoundland	12 B/10	7-Jun	0	0	2	4.4	-	-
3	Western Brook	Newfoundland	12 H/13	12-Jun	0	0	2	1.2	0	0
35	Windmill Bight	Newfoundland	2 F/05	12-Jun	0	0	2	0.8	-	n
Newfoundland				Totals	39	96	71.4	7	27	0

Map #	Site	Location	1:50,000 NTS Map Sheet	Date	No. pairs	No. adults	2001 census		91 census	96 census
							No. of Observer s	distance covered (km)		
1	Dune de Miquelon	St. Pierre et Miquelon	11 P/01	12-Jun	0	0	2	3	0	0
3	Gully of Grand Barachois	St. Pierre et Miquelon	11 I/16	11-Jun	1	3	2	12	2	0
2	Northeast of Gully of Grand Barachois	St. Pierre et Miquelon	11 / 01, 1 I/16	19-Jun	2	4	1	5	0	0
4	West Side of Isthme de Langlade	St. Pierre et Miquelon	11 I/16	11-Jun	1	2	2	*	2	6
St. Pierre et Miquelon				Totals	4	9	7	20	4	6

\* km surveyed included in "Gully of Grand Barachois" survey

---

## The 2001 Piping Plover census in Nova Scotia

Julie McKnight

*Canadian Wildlife Service, Atlantic Region, 17 Waterfowl Lane, Sackville, New Brunswick E4L 1G6*

### Abstract

During the 2001 International Piping Plover Census, 93 Piping Plovers were counted at 24 beaches in Nova Scotia (consisting of 43 pairs and 7 singles). This represents an increase from 79 birds counted during the 1996 International Piping Plover census. However, in 2001 there were fewer counted compared to the census count of 113 birds (51 pairs) in 1991, even though an increase of 10 pairs was observed from the previous census conducted in 1996. While the number of pairs has increased from 1996 to 2001, number of young surviving to fledge has decreased.

### Résumé

En Nouvelle-Écosse, 93 pluviers ont été dénombrés sur 24 plages (43 couples et sept oiseaux sans partenaire), ce qui représente une hausse par rapport aux 79 individus et aux 33 couples comptés lors du recensement international de 1996. Malgré tout, ce résultat est inférieur au chiffre enregistré lors du recensement de 1991, au cours duquel 113 oiseaux (51 couples) avaient été dénombrés. La hausse du nombre de couples par rapport à 1996 ne s'est pas traduite par une augmentation correspondante du nombre d'oisillons qui survivent jusqu'au premier envol.

### Introduction

Since 1996, there has been considerable progress made in terms of provincial and non-governmental efforts to protect the Piping Plover (*Charadrius melodus melodus*). The Nova Scotia Endangered Species Act was passed in December 1998, and in June 2000, Piping Plovers were listed as endangered. The act prohibits injuring, killing, disturbing, or interfering with Piping Plovers or attempting to do so. Possession, selling, buying or trading of this species is prohibited by the Act, as is the destruction, disturbance, or interference with their nests or core habitat.

When the Nova Scotia Piping Plover Guardian Program began in 1992, it was based on volunteer effort. The program was a great success in areas with a large base of volunteers but due to the unpredictable nature of volunteers and the lack of volunteers in some areas, critical Piping Plover habitats went unprotected. Habitat Stewardship Program funds were provided to the Nova Scotia Bird Society in 2001, and a full time coordinator was hired to rebuild the Guardian program. The coordinator has focused on the areas where the greatest numbers of Piping Plovers breed and where volunteers have been difficult to recruit. The guardian program compliments the monitoring efforts of government biologists by providing a presence on Piping Plover beaches that receive high human disturbance (Anna McCarron pers. comm.). Through the work of volunteers and government staff, nesting and productivity data have been consistently reported province-wide since 1997.

## 2001 Piping Plover Census

This report details results of the 2001 International Census in Nova Scotia and the outcome of monitoring efforts by The Nova Scotia Department of Natural Resources (NSDNR), Parks Canada and Nova Scotia Piping Plover Guardians.

### Methods

Suitable sites were chosen based on 1991 and 1996 census lists and results. Information (on beach suitability) arising from the 1996 census and observations reported by NSDNR Regional Biologists and local naturalists since then were used to add and remove sites from the list. A total of 119 beaches were surveyed for the 2001 International Piping Plover Census. Of these, 27 were new sites not visited in either the 1996 or 1991 censuses, and 8 sites surveyed in previous years were not revisited because of site unsuitability.

Kits containing census information and guidelines, a list of beaches and Piping Plover census sheets were sent out by the Nova Scotia Provincial Coordinator (Pamela Mills). A total of 37 individuals spent over 130 hours surveying sites for the 2001 census. Participants were associated with NSDNR (19), Nova Scotia Piping Plover Guardians (5), Canadian Wildlife Service-Atlantic Region (2), Parks Canada (1), Friends of Keji Cooperating Association (1), University College of Cape Breton: Department of Biology (4), Pictou County Naturalists Club (2), and Volunteers without affiliation (3).

The International Census was completed in Nova Scotia during 4 to 20 June (Table 1), therefore some surveys were conducted outside the 3 to 16 June window. Some deviations from the census period of 3 to 16 June were reported. Bull (Taylor Head Provincial Park), Taylor Head, Oxner's Beach, Little Port Joli Bay (Kejimikujik National Park Seaside Adjunct), Port Mouton Island (Back Beach), Pondville, Rear Point Michaud and Rocky Bay Beach were surveyed outside the official census period from 18 to 20 June. Reported weather conditions for surveys were satisfactory, with most counts (82%) conducted under clear or partly cloudy skies with calm or moderate breezes.

NSDNR, Nova Scotia Piping Plover Guardians and Parks Canada staff collected nesting data at 22 beach sites. Investigators followed nesting pairs until the result of a nesting attempt was determined and outcome of young was ascertained at 25 days or when young were observed in sustained (>15 m) flight. Productivity was calculated as the number of fledged young per pair monitored on a given beach.

### Results

Ninety-three Piping Plovers were counted at 24 sites; 19 of these sites were located in Lunenburg (3), Queens (4) and Shelburne (12) counties on the South Shore of Nova Scotia, and the other 5 sites were found in Antigonish (2), Halifax (1), Pictou (1) and Victoria (1) Counties. Unsuitable or minimal nesting habitat was reported at 11 of the 119 beaches surveyed in 2001.

The distribution of Piping Plover in 2001 has changed in comparison to previous censuses. There were 20 beaches where Piping Plovers were observed in 1991 and/or 1996 but did not have birds in 2001 (Table 2). St. Catherines River in Kejimikujik National Park Seaside Adjunct, Baccaro (Crow Neck) and Daniels Head (Southside) Beaches along the South Shore supported the largest numbers of Piping Plovers ( $\geq 8$  plovers).

In 2001, 22 sites were intensively monitored to gather nesting and fledging productivity data (Table 3). The nesting outcome at South Harbour was unknown, and so productivity was calculated for 21 sites. The total count across the province was 46 pairs nesting a total of 56 times (including 10

## 2001 Piping Plover Census

renests). From the 56 nests, 209 eggs were discovered, of which 134 hatched (0.64 hatching success). Causes of nest loss included predation, abandonment, over-wash as a result of high tides, and destruction by a vehicle (1 circumstance). In some cases, the reason for nest failure was not known. Total productivity for the province was 1.51 chicks fledged per pair, however productivity on the South Shore was 1.26.

### Discussion

In 2001 a considerable increase (+10 pairs, 14 adults) in the number of Piping Plovers on Nova Scotia's beaches was observed compared to the International census completed in 1996 (i.e. 93 adults in 2001 versus 79 in 1996). The number of occupied beaches remained virtually the same (25 in 1996 and 24 in 2001). There were however changes in distribution between 1996 and 2001. Piping Plovers were present on five beaches in 2001 that were unoccupied in 1996, and absent on seven beaches in 2001 that were previously occupied in 1996. The biggest changes occurred in Shelburne and Queens Counties. Shelburne County gained Piping Plovers on four beaches, but Piping Plovers were lost at three Queens County beaches.

The annual Piping Plover data compiled in recent years for Nova Scotia reflects a slightly increasing or stable population at approximately 40 pairs (Table 4, Figure 2). Except for a small decrease in 1998, the number of Piping Plover pairs was stable or increased slightly from 1996 to 2001. Important increases were reported in 1997 and 2001 (7 and 9 pairs, respectively). The decline in the total number of adults in 1998 is mainly due to the low number of singles reported in that year, but also owing to a decline of three pairs observed from the previous year. Effort and coverage were relatively consistent from 1997-2000 (as International Census years, effort during the breeding seasons of 1996 and 2001 was considerably higher).

Despite a slight increase in the number of Piping Plover pairs nesting on Nova Scotia's beaches and the increase in monitoring and protection efforts since 1996, the number of young surviving to fledge has not increased. It may be that continued human disturbance has played a significant role in the survivorship of Piping Plover young in Nova Scotia. Chicks alter their behaviour in response to approaching humans and uncontrolled pets, resulting in a significant reduction in the time spent feeding and brooding (Flemming *et al.* 1988). A reduction in these behaviours intensifies the vulnerability of chicks to inclement weather and predators, and consequently causes increased chick mortality (Flemming *et al.* 1988).

The distribution of breeding pairs and the outcome of nests is also affected by disturbance at the nesting site. Unfortunately, some degree of disturbance by humans (recreational and/or illegal vehicular activity), unrestrained dogs and/or the presence of predators was reported at nearly all sites monitored for breeding success. Incidents of a more serious nature were reported at five of these sites. Cherry Hill Beach experienced an occurrence of vandalism in 2001; the symbolic fencing surrounding two Piping Plover nests (the nests were separated by 10-20 m, and so enclosed by the same fence) was removed and destroyed. One of the predator exclosures was removed from the nest site and damaged, and a human shoe impression was clearly imprinted in the sand within 10 cm of the nest bowl. At Southside (Daniel's Head) Beach, a nest in the dune region was destroyed by a truck, and recurring illegal vehicular activity was noted at seven other sites. Unrestrained dogs were noted as concerns on numerous beaches, including Pomquet Beach, where an adult Piping Plover was chased by an uncontrolled dog. Natural predators were also of concern. Gulls were observed hunting chicks at Pomquet, Southside (Daniel's Head) and Summerville Beaches. Fresh crow tracks were observed around the periphery as well as

## 2001 Piping Plover Census

inside an enclosure at Sand Hills (Sebim) Provincial Park, and the eggs were gone from that nest. The string at the top had slackened, obviously enough for a crow to enter and fly out (P. MacDonald pers. comm.). It is likely that a second nest at Sand Hills Beach was depredated in the same manner. In addition to the crow depredation, fox activity was concentrated on Sand Hills Beach, and may have played a role in the abandonment of the third (late nesting) pair. The disturbance caused by humans and natural predators is compounded by the marginal habitat available to Piping Plovers on Nova Scotia's sand beaches (Boates 1996).

Continuing efforts to reduce disturbance to Piping Plovers and their habitat include large information signs posted at entrances to beaches where Piping Plovers are known to occur, sections of beach surrounding Piping Plover nests marked with symbolic fencing and predator exclosures used to affect an increase in hatching success. Of the 56 nesting attempts in 2001, 40 were protected with predator exclosures. Of the exclosed nests, 28 successfully hatched at least one chick, representing 70% nest success. Nest success for those not protected with predator exclosures was 69% (11 of 16 nests hatched >1 egg). Of the 11 successful nests that were not protected with predator exclosures, five received intense guardian activity and two were practically inaccessible to the public. Other recovery efforts in Nova Scotia include increased monitoring effort, an increase in Conservation Officer presence in 2000 and 2001 on Piping Plover beaches, and an improved Guardian program that will continue to improve public awareness of Piping Plovers.

Efforts to protect Piping Plover nests from predators and human disturbances have been relatively easy to implement and are known to be effective (Rimmer and Deblinger 1990; Deblinger *et al.* 1992; Melvin *et al.* 1992; Mabee and Estelle 2000). Despite increased protective measures and an increase in the number of Piping Plover pairs using Nova Scotia beaches since the 1996 Census, no corresponding increase in productivity has been observed. Productivity estimates declined from 1.97 to 1.51 chicks fledged per pair between 1997-2001 (Table 4, Figure 2). Causes for this decline in productivity need to be addressed. Measures intended to protect precocial young Piping Plovers will not be as easily implemented as nest protection methods.

Public education is perhaps the greatest contribution to the conservation effort for recovery of Piping Plovers and the preservation of their habitat. A shift in public attitude toward these shorebirds must be continually promoted and proper land-use practices (i.e. waste disposal), and wise land management by landowners must be encouraged.

## Acknowledgements

Many thanks go to Pamela Mills, the Nova Scotia Provincial Coordinator, for preparation and distribution of the Census packages. Mark Elderkin, Sherman Boates, NSDNR Regional Biologists and Conservation Officers, Biologists with the Canadian Wildlife Service, as well as Anna McCarron (the Guardian Program Coordinator), Etta Parker for her many years with the Guardian Program and the many diligent Guardians, are acknowledged here for their work in protecting Piping Plovers in Nova Scotia. Thanks go to the personnel from Nova Scotia Department of Natural Resources (District Office and Wildlife Division), Canadian Wildlife Service-Atlantic Region and Parks Canada, as well as volunteers affiliated with the NS Piping Plover Guardians, Pictou Naturalists Club and Department of Biology at the University College of Cape Breton, who participated in the Census and/or in collecting productivity information. These are: Diane Amirault, Don Anderson, Doug Archibald, Angela Bond, Glen Boutlier,

## 2001 Piping Plover Census

---

Rick Brunt, Jenny Costelo, David Dauphine, George Digout, Sharon Digout, Jenny Duncan, Glen Gibson, Daniele Gouthro, Ross Hall, Susan Hawkins, James Hirtle, Richard Knapton, Larry MacDonnell, Peter MacDonald, Amy Marsters, Patrick McCamphill, Anna McCarron, Pat McCarty, Sarah McChesney, David McCorquodale, Eric McCorquodale, Ken McKenna, John Mills, Terry Power, Mark Pulsifer, Deanne Ray, Chris Thomson, Charlie Rudolph, Bridget Tutty, Steve Vines and Trevor Wilkie.

Completion of the International Census was made possible through funding provided by the Nova Scotia Department of Natural Resources, Park Canada Agency, Environment Canada's Science Horizons Program, Habitat Stewardship Program and the Canadian Wildlife Service Species at Risk Program.



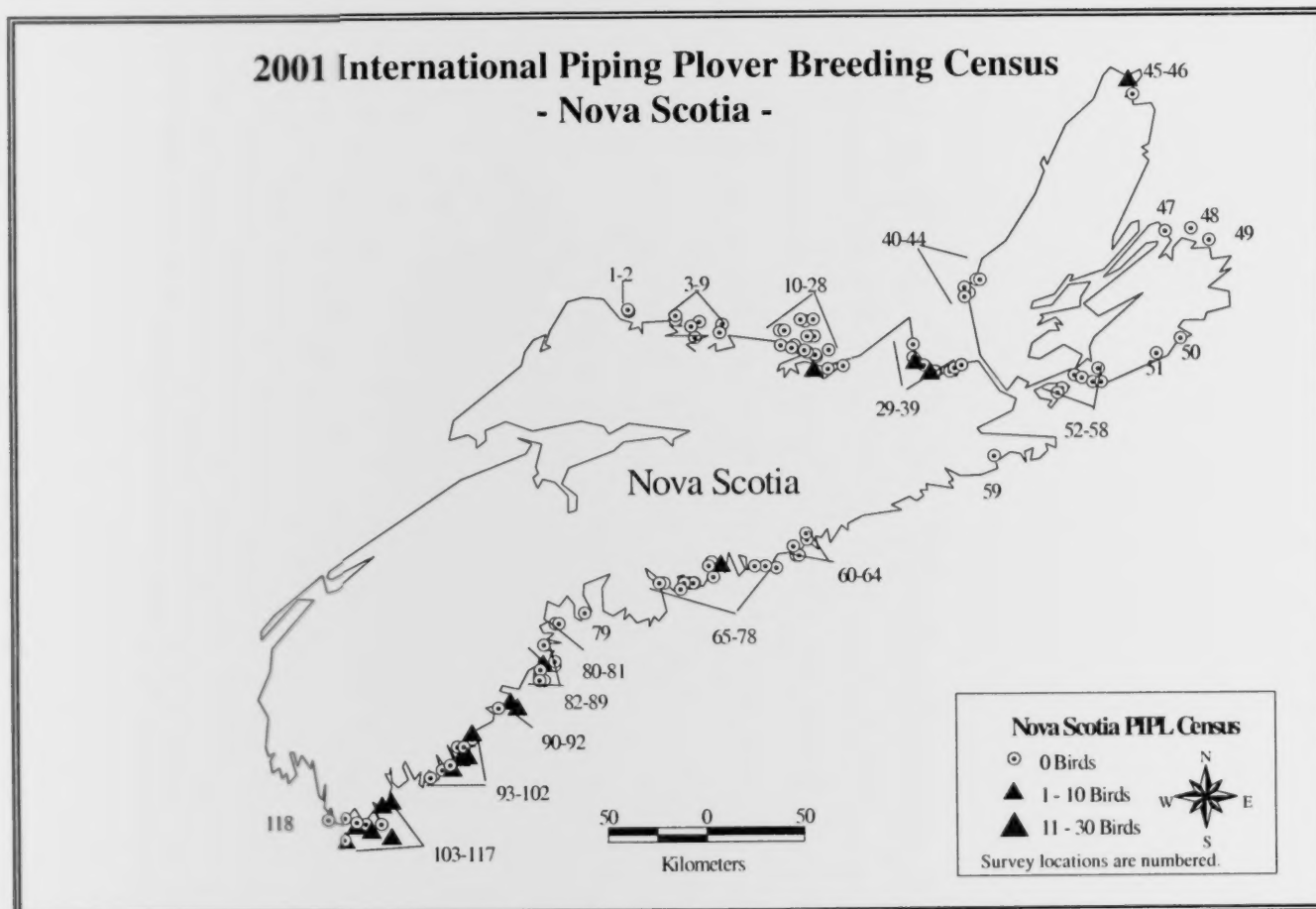


Figure 1. Distribution of Piping Plover in Nova Scotia during 2001 census.

# 2001 Piping Plover Census

Table 1. Results of 2001 International Piping Plover Breeding Census in Nova Scotia

Map #	Site	County	1:50,000 NTS Map Sheet	Date	No. of pairs	No. of adults	2001 census		No. of hours	91 census	96 census
							No. of observers	Distance surveyed (km)			
35	Bayfield	Antigonish	11F/12	11 June	0	0	2	2.5	1.0	Yes	Yes
33	Captains Pond and Monks Head	Antigonish	11F/12	07, 11 June	0	0	2	3.0	1.4	Yes	Yes
32	Dunns	Antigonish	11F/12	07 June	0	0	2	2.0	2.0	Yes	Yes
36	Ferry Road (Grahams Cove)	Antigonish	11F/12	11 June	0	0	2	1.5	1.5	Yes	Yes
39	Linwood	Antigonish	11F/12	08 June	0	0	2	1.5	0.3	No	Yes
31	Mahoney's	Antigonish	11F/12	06, 11 June	2	6	2	2.5	0.7	Yes	Yes
30	Ogdens Pond	Antigonish	11F/12	07 June	0	0	2	0.5	?	No	No
34	Pomquet	Antigonish	11F/12	06 June	2	6	1	3.0	2.5	Yes	Yes
29	South Lakevale (Cribbons)	Antigonish	11F/13	07 June	0	0	2	0.5	0.5	No	Yes
38	Tracadie Big Island (Delorey Island)	Antigonish	11F/12	08 June	0	0	2	2.0	1.2	Yes	Yes
37	Tracadie West Arm	Antigonish	11F/12	08 June	0	0	2	2.0	0.3	Yes	Yes
50	Belfry to Winging Point	Cape Breton	11F/16	15 June	0	0	4	5.0	4.5	No	No
48	Dominion (Lingan)	Cape Breton	11K/01	13 June	0	0	1	2.5	0.8	Yes	Yes
49	Glance Bay Bar	Cape Breton	11J/04	12 June	0	0	1	2.0	1.5	Yes	Yes
47	South East Bar	Cape Breton	11K/01	12 June	0	0	1	1.5	1.5	No	Yes
7	Sand Point	Colchester	11E/11	05 June	0	0	1	0.5	0.7	No	Yes
1	Cameron	Cumberland	11E/13	07 June	0	0	1	0.7	0.3	Yes	Yes
4	Hortons	Cumberland	11E/14	06 June	0	0	1	1.0	0.8	Yes	Yes
5	Long	Cumberland	11E/14	05 June	0	0	1	0.3	0.5	Yes	Yes
3	Oak Island	Cumberland	11E/14	06 June	0	0	1	4.0	3.0	Yes	Yes
6	Treen Point/Malagash Mines	Cumberland	11E/14	05 June	0	0	1	1.0	1.2	Yes	Yes
2	West Pugwash	Cumberland	11E/13	07 June	0	0	1	1.0	0.8	Yes	Yes
59	Tor Bay	Guysborough	11F/03	14 June	0	0	1	1.0	1.8	No	Yes
64	Baltee Island (Romkey's Point)	Halifax	11D/15	15 June	0	0	1	0.2	0.2	No	Yes
60	Bull, Taylor Head Provincial Park	Halifax	11D/15	18 June	0	0	1	0.2	0.5	No	Yes
66	Clam Harbour	Halifax	11D/10	09 June	0	0	1	1.0	1.5	Yes	Yes
74	Conrads (East and West)	Halifax	11D/11	14 June	0	0	2	2.0	1.5	Yes	Yes



## 2001 Piping Plover Census

Table 1. Results of 2001 International Piping Plover Breeding Census in Nova Scotia (cont.)

Map #	Site	County	1:50,000 NTS Map Sheet	Date	No. of pairs	No. of adults	2001 census		No. of hours	91 census	96 census
							No. of observers	Distance surveyed (km)			
69	Conrods, Petpeswick Inlet	Halifax	11D/11	08 June	0	0	1	0.8	0.5	Yes	Yes
76	Cow Bay	Halifax	11D/11	05 June	0	0	1	1.2	0.8	Yes	Yes
71	Fishermans	Halifax	11D/11	08 June	0	0	1	1.5	0.5	No	Yes
73	Lawrencetown	Halifax	11D/11	14 June	0	0	2	2.0	0.8	No	Yes
65	Little Harbour (Sandbar Beach)	Halifax	11D/10	11 June	0	0	1	1.1	1.3	No	No
70	Long (Meisners)	Halifax	11D/11	08 June	0	0	1	1.2	1.0	No	Yes
68	Martinique	Halifax	11D/11	07, 13 June	1	3	1	2.5	2.0	Yes	Yes
78	Maugher, McNabs Island	Halifax	11D/12	05 June	0	0	1	1.6	0.8	Yes	Yes
77	McCormick's, Eastern Passage	Halifax	11D/11	05 June	0	0	1	1.0	0.5	No	Yes
75	Rainbow Haven Park (Cole Harbour)	Halifax	11D/11	05 June	0	0	1	1.6	0.9	Yes	Yes
62	Sandy Cove and Eastern Sandy Cove	Halifax	11D/15	15 June	0	0	2	0.2	0.2	No	Yes
63	Sandy Cove West	Halifax	11D/15	15 June	0	0	2	0.2	0.1	No	No
67	Seapool (West Marsh)	Halifax	11D/10	10 June	0	0	1	1.5	1.5	Yes	Yes
72	Stoney (Lawrencetown Head)	Halifax	11D/11	08 June	0	0	1	0.5	0.6	Yes	Yes
61	Taylor Head	Halifax	11D/15	18 June	0	0	1	1.0	0.5	Yes	Yes
40	Big Rorys (Emerson) Point	Inverness	11F/13	07 June	0	0	1	0.7	1.3	Yes	Yes
44	Colindale (MacLean's Cove)	Inverness	11K/04	11, 15 June	0	0	2	0.5	1.2	Yes	Yes
41	Little Judique Harbour	Inverness	11F/13	07, 15 June	0	0	2	0.9	1.7	Yes	Yes
42	Port Hood	Inverness	11K/04	11, 15 June	0	0	2	2.4	3.4	Yes	Yes
43	South West Mabou	Inverness	11K/03	11 June	0	0	1	1.6	0.8	No	No
79	Bayswater	Lunenburg	21A/09	06 June	0	0	2	0.1	0.5	Yes	Yes
89	Cape Bay, Cape LaHave Island	Lunenburg	21A/01	11 June	0	1	2	1.0	1.0	Yes	Yes
90	Cherry Hill (Conrad)	Lunenburg	21A/02	06 June	3	6	2	2.0	1.9	Yes	Yes
88	Halibut Bay (Cape LaHave Island)	Lunenburg	21A/01	11 June	0	0	2	0.1	0.8	Yes	Yes
84	Hirtles	Lunenburg	21A/08	10 June	0	0	2	2.0	1.2	Yes	Yes
83	Kingsburg	Lunenburg	21A/08	05 June	0	0	1	1.0	1.0	No	Yes
82	Masons	Lunenburg	21A/08	05 June	0	0	1	0.5	1.3	Yes	No
81	Masons Island	Lunenburg	21A/01	14 June	0	0	2	0.8	0.5	Yes	Yes

## 2001 Piping Plover Census

Table 1. Results of 2001 International Piping Plover Breeding Census in Nova Scotia (cont.)

Map #	Site	County	1:50,000 NTS Map Sheet	Date	2001 census						
					No. of pairs	No. of adults	No. of observers	Distance surveyed (km)	No. of hours	91 census	96 census
85	Oxner's Beach	Lunenburg	21A/08	20 June	1	2	4	0.1	0.8	No	No
80	Rafuse Island	Lunenburg	21A/08	14 June	0	0	2	0.3	0.3	Yes	Yes
86	Sloop Cove (Moshers Island)	Lunenburg	21A/01	11 June	0	0	2	0.1	0.5	Yes	Yes
87	The Creek, Cape LaHave Island	Lunenburg	21A/01	11 June	0	0	2	1.5	1.0	No	Yes
28	Big Merigomish Island	Pictou	11E/09	11 June	0	0	2	2.5	3.0	Yes	Yes
23	Bowen Island	Pictou	11E/10	07 June	1	2	2	1.5	0.5	Yes	Yes
9	Cape John, Megs Cove	Pictou	11E/14	08 June	0	0	1	1.0	0.5	No	No
13	Caribou Island, Caribou Reef	Pictou	11E/15	05 June	0	0	1	1.0	0.5	No	Yes
12	Caribou Island, Hawksbill Point	Pictou	11E/15	05 June	0	0	1	1.0	0.6	No	Yes
11	Caribou Island, Narrows	Pictou	11E/15	05 June	0	0	1	0.5	0.3	No	No
27	Chance Harbour	Pictou	11E/10	04 June	0	0	1	1.0	0.7	No	Yes
22	James & Little Harbour Spit	Pictou	11E/10	07 June	0	0	2	1.2	0.5	Yes	Yes
25	Kings Head	Pictou	11E/09	06 June	0	0	1	0.5	0.5	Yes	Yes
24	Melmerby	Pictou	11E/09, 10	06 June	0	0	1	2.5	2.0	Yes	Yes
20	Pictou Bar Spit (Lighthouse)	Pictou	11E/10	06 June	0	0	1	1.0	1.7	Yes	Yes
19	Pictou Island, East End	Pictou	11E/15	12 June	0	0	2	1.3	0.7	No	No
17	Pictou Island, John Dans Cove	Pictou	11E/15	12 June	0	0	2	0.7	0.7	No	No
15	Pictou Island, North Shore	Pictou	11E/15	12 June	0	0	2	0.8	0.5	No	Yes
18	Pictou Island, Roger Point	Pictou	11E/15	12 June	0	0	2	1.2	0.8	No	Yes
16	Pictou Island, West End	Pictou	11E/15	12 June	0	0	2	0.3	0.3	No	No
14	Pictou Island, Wharf	Pictou	11E/15	12 June	0	0	2	0.3	0.2	No	No
21	Roaring Bull Point (Sinclair's Island)	Pictou	11E/10	05 June	0	0	1	0.8	0.8	Yes	Yes
8	Rushtons Park (Murray)	Pictou	11E/14	08 June	0	0	1	1.5	0.5	Yes	Yes
26	Savage Point, Big Merigomish Island	Pictou	11E/09	11 June	0	0	2	1.0	0.8	Yes	Yes
10	Waterside Beach Park	Pictou	11E/15	05 June	0	0	1	1.0	0.8	Yes	No
92	Beach Meadows	Queens	21A/02	06 June	0	0	2	1.0	0.7	Yes	Yes
94	Carters & Wobamkek	Queens	20P/15	04 June	0	0	1	1.0	1.5	Yes	Yes
97	Little Port Joli Bay, KejNP	Queens	20P/15	20 June	0	0	2	1.5	1.5	Yes	Yes

## 2001 Piping Plover Census

Table 1. Results of 2001 International Piping Plover Breeding Census in Nova Scotia (cont.)

Map #	Site	County	1:50,000 NTS Map Sheet	Date	No. of pairs	No. of adults	2001 census		No. of hours	91 census	96 census
							No. of observers	Distance surveyed (km)			
96	Port Joli Harbour (Goose Haven)	Queens	20P/15	12 June	0	0	2	2.0	1.3	Yes	Yes
99	Port Mouton Island, Back Beach	Queens	20P/15	20 June	0	0	4	0.8	0.5	Yes	Yes
91	Ragged Harbour	Queens	21A/02	07 June	1	2	1	0.3	0.3	No	Yes
98	Sandy Bay	Queens	20P/15	06 June	0	1	1	1.0	2.0	Yes	Yes
95	St Catherines River, KejNP Adjunct	Queens	20P/15	11 June	4	8	2	1.6	2.3	Yes	Yes
93	Summerville	Queens	20P/15	04 June	2	4	1	1.0	1.0	Yes	Yes
54	Crossroads (L'Ardoise)	Richmond	11F/10	13, 14 June	0	0	2	3.0	1.4	No	No
56	Grand Greve	Richmond	11F/10	13, 14 June	0	0	2	3.0	1.4	No	No
51	Morrison's, Framboise	Richmond	11F/09	12 June	0	0	2	2.0	1.5	No	No
53	Point Michaud	Richmond	11F/10	13, 14 June	0	0	2	3.0	1.4	No	No
58	Pondville	Richmond	11F/10	18 June	0	0	1	0.5	1.3	No	No
52	Rear Point Michaud	Richmond	11F/10	18 June	0	0	1	0.5	1.3	No	No
55	Rockdale	Richmond	11F/10	13, 14 June	0	0	2	3.0	1.4	No	No
57	Rocky Bay	Richmond	11F/10	18 June	0	0	1	1.0	1.3	No	No
107	Baccaro (Crow Neck)	Shelburne	20P/06	11 June	4	8	2	1.5	2.2	Yes	Yes
102	Black Point (Mathews Lake)	Shelburne	20P/11	11 June	0	0	2	3.0	1.5	Yes	Yes
106	Blanche Point	Shelburne	20P/06	15 June	0	0	1	0.5	0.6	Yes	Yes
109	Burks Point (Powells)	Shelburne	20P/05	06 June	0	0	1	1.0	0.8	Yes	Yes
112	Clam Point	Shelburne	20P/05	13 June	1	2	1	1.0	0.8	Yes	Yes
114	Daniels Head (Southside)	Shelburne	20P/05	08 June	6	12	2	2.0	2.2	Yes	Yes
118	Fish Island	Shelburne	20P/05	14 June	0	0	3	0.5	0.4	No	No
105	Fox Bar	Shelburne	20P/11	04 June	2	4	2	1.4	2.2	Yes	Yes
108	Goose (Indian) Point	Shelburne	20P/05	06 June	0	0	1	1.0	0.5	Yes	Yes
115	Inner (The Cape)	Shelburne	20P/05	14 June	1	2	3	3.0	0.7	Yes	Yes
100	Johnstons Pond	Shelburne	20P/15	08 June	1	2	1	0.9	1.8	Yes	Yes
101	Louis Head	Shelburne	20P/14	06 June	0	0	1	1.9	1.7	Yes	Yes
111	Northeast Point	Shelburne	20P/12	11 June	0	0	3	1.5	0.5	Yes	Yes

# 2001 Piping Plover Census

Table 1. Results of 2001 International Piping Plover Breeding Census in Nova Scotia (cont.)

Map #	Site	County	1:50,000 NTS Map Sheet	Date	2001 census						91 census	96 census
					No. of pairs	No. of adults	No. of observers	Distance surveyed (km)	No. of hours			
117	Ratcliffe Hills (The Cape)	Shelburne	20P/05	14 June	0	0	1	1.0	0.7	No	No	
104	Red Head	Shelburne	20P/11	12 June	1	2	2	2.0	1.3	Yes	Yes	
103	Round Bay & Roseway	Shelburne	20P/11	06 June	2	4	2	0.8	1.4	Yes	Yes	
110	Sand Hills Provincial Park (Sebim)	Shelburne	20P/12	12 June	3	6	2	1.4	3.5	Yes	Yes	
113	Stoney Island	Shelburne	20P/05	11 June	1	2	1	2.2	1.5	Yes	Yes	
116	The Hawk	Shelburne	20P/05	11 June	2	4	1	0.5	0.8	Yes	Yes	
116	The Hawk Point	Shelburne	20P/05	11 June	1	2	1	1.5	0.8	No	No	
45	North Harbour	Victoria	11K/16	16 June	0	0	1	2.0	1.5	Yes	Yes	
46	South Harbour	Victoria	11K/16	16 June	1	2	1	1.5	1.3	Yes	Yes	
Totals					93	186	159.3	130.2				

# 2001 Piping Plover Census

Table 2. Changes in abundance of Piping Plovers in Nova Scotia: comparison of results from the 1991, 1996 and 2001 International Censuses

Site	County	No. of pairs			No. of adults			Percent change (pairs)			Percent change (adults)		
		1991	1996	2001	1991	1996	2001	1991-1996	1996-2001	1991-2001	1991-1996	1996-2001	1991-2001
Bayfield	Antigonish	0	0	0	0	0	0	0	0	0	0	0	0
Captains Pond and Monks Head	Antigonish	0	1	0	0	2	0	+	-100	0	+	-100	0
Dunns	Antigonish	0	0	0	0	0	0	0	0	0	0	0	0
Ferry Road (Grahams Cove)	Antigonish	0	0	0	0	0	0	0	0	0	0	0	0
Jimtown	Antigonish	nc	0	nc	nc	0	nc	~	~	~	~	~	~
Linwood	Antigonish	nc	0	0	nc	0	0	~	0	~	~	0	~
Mahoney's	Antigonish	0	2	2	0	4	6	+	0	+	+	+50	+
Ogdens Pond	Antigonish	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Pomquet	Antigonish	1	2	2	2	6	6	+100	0	+100	+200	0	+200
South Lakevale (Cribbons)	Antigonish	nc	0	0	nc	0	0	~	0	~	~	0	~
Tracadie Big Island (Delorey Island)	Antigonish	0	0	0	0	0	0	0	0	0	0	0	0
Tracadie West Arm	Antigonish	0	0	0	0	0	0	0	0	0	0	0	0
Belfry to Winging Point	Cape Breton	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Dominion (Lingan)	Cape Breton	1	0	0	2	0	0	-100	0	-100	-100	0	-100
Glace Bay Bar	Cape Breton	0	0	0	0	0	0	0	0	0	0	0	0
Kennington Cove	Cape Breton	0	0	nc	0	0	nc	0	~	~	0	~	~
South East Bar	Cape Breton	nc	0	0	nc	0	0	~	0	~	~	0	~
Sand Point	Colchester	nc	0	0	nc	0	0	~	0	~	~	0	~
Cameron	Cumberland	0	nc	0	0	nc	0	~	~	0	~	~	0
Hortons	Cumberland	0	0	0	0	0	0	0	0	0	0	0	0
Long (Cumberland Co.)	Cumberland	0	0	0	0	0	0	0	0	0	0	0	0
Treen Point/Malagash Mines	Cumberland	0	0	0	0	0	0	0	0	0	0	0	0
Oak Island	Cumberland	0	1	0	0	2	0	+	-100	0	+	-100	0
West Pugwash	Cumberland	0	0	0	0	0	0	0	0	0	0	0	0
Clam Pond	Guysborough	0	0	nc	0	0	nc	0	~	~	0	~	~
Ragged Head Pond	Guysborough	0	0	nc	0	0	nc	0	~	~	0	~	~
Tor Bay	Guysborough	nc	0	0	nc	0	0	~	0	~	~	0	~
Baltee Island (Romkey's Point)	Halifax	nc	0	0	nc	0	0	~	0	~	~	0	~
Bull, Taylor Head Provincial Park	Halifax	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Clam Harbour	Halifax	1	0	0	2	0	0	-100	0	-100	-100	0	-100
Conrads (East and West)	Halifax	1	0	0	2	0	0	-100	0	-100	-100	0	-100

# 2001 Piping Plover Census

Table 2. Changes in abundance of Piping Plovers in Nova Scotia: comparison of results from the 1991, 1996 and 2001 International Censuses (cont.)

Site	County	No. of pairs			No. of adults			Percent change (pairs)			Percent change (adults)		
		1991	1996	2001	1991	1996	2001	1991-1996	1996-2001	1991-2001	1991-1996	1996-2001	1991-2001
Cow Bay	Halifax	0	0	0	0	0	0	0	0	0	0	0	0
Fishermans	Halifax	0	0	0	0	0	0	0	0	0	0	0	0
Lawrencetown	Halifax	nc	0	0	nc	0	0	~	0	~	~	0	~
Little Harbour (Sandbar Beach)	Halifax	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Long (Meisners)	Halifax	0	0	0	0	0	0	0	0	0	0	0	0
Martinique	Halifax	1	0	1	2	0	3	-100	+	0	-100	+	+50
Maugher, McNabs Island	Halifax	0	0	0	0	0	0	0	0	0	0	0	0
McCormick's, Eastern Passage	Halifax	nc	0	0	nc	0	0	~	0	~	~	0	~
Rainbow Haven Park (Cole Harbour)	Halifax	1	0	0	3	0	0	-100	0	-100	-100	0	-100
Sandy Cove and Eastern Sandy Cove	Halifax	nc	0	0	nc	0	0	~	0	~	~	0	~
Sandy Cove West	Halifax	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Seapool	Halifax	0	0	0	0	0	0	0	0	0	0	0	0
Stoney (Lawrencetown Head)	Halifax	1	0	0	2	0	0	-100	0	-100	-100	0	-100
Taylor Head	Halifax	0	0	0	0	0	0	0	0	0	0	0	0
Big Rorys (Emerson) Point	Inverness	0	0	0	0	0	0	0	0	0	0	0	0
Colindale	Inverness	0	0	0	0	0	0	0	0	0	0	0	0
Little Judique Harbour	Inverness	0	0	0	0	0	0	0	0	0	0	0	0
Port Hood	Inverness	0	0	0	0	0	0	0	0	0	0	0	0
South West Mabou	Inverness	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Bayswater	Lunenburg	0	0	0	0	0	0	0	0	0	0	0	0
Cape Bay, Cape LaHave Island	Lunenburg	2	1	0	4	2	1	-50	-100	-100	-50	-50.0	-75
Cherry Hill (Conrad)	Lunenburg	3	0	3	6	1	6	-100	+	0	-83.3	+500	0
Halibut Bay	Lunenburg	0	0	0	0	0	0	0	0	0	0	0	0
Hirtles	Lunenburg	0	0	0	0	0	0	0	0	0	0	0	0
Kingsburg	Lunenburg	0	0	0	0	0	0	0	0	0	0	0	0
Masons	Lunenburg	0	0	0	0	0	0	0	0	0	0	0	0
Masons Island	Lunenburg	0	0	0	0	0	0	0	0	0	0	0	0
Oxner's Beach	Lunenburg	nc	nc	1	nc	nc	2	~	~	~	~	~	~
Rafuse Island	Lunenburg	0	0	0	0	0	0	0	0	0	0	0	0
Sloop Cove (Moshers Island)	Lunenburg	0	0	0	0	0	0	0	0	0	0	0	0

## 2001 Piping Plover Census

Table 2. Changes in abundance of Piping Plovers in Nova Scotia: comparison of results from the 1991, 1996 and 2001 International Censuses (cont.)

Site	County	No. of pairs			No. of adults			Percent change (pairs)			Percent change (adults)		
		1991	1996	2001	1991	1996	2001	1991-1996	1996-2001	1991-2001	1991-1996	1996-2001	1991-2001
The Creek, Cape LaHave Island	Lunenburg	0	0	0	0	0	0	0	0	0	0	0	0
Big Merigomish Island	Pictou	0	0	0	0	0	0	0	0	0	0	0	0
Bowen Island	Pictou	2	1	1	4	2	2	-50	0	-50	-50	0	-50
Cape John, Megs Cove	Pictou	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Caribou Island	Pictou	0	0	0	0	0	0	0	0	0	0	0	0
Caribou Island, Hawksbill Point	Pictou	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Caribou Island, Narrows	Pictou	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Chance Harbour	Pictou	nc	0	0	nc	0	0	~	0	~	~	0	~
James & Little Harbour Spit	Pictou	0	0	0	1	0	0	0	0	0	-100	0	-100
Kings Head	Pictou	0	0	0	0	0	0	0	0	0	0	0	0
Melmerby	Pictou	0	0	0	0	0	0	0	0	0	0	0	0
Pictou Bar Spit (Lighthouse)	Pictou	1	0	0	2	0	0	-100	0	-100	-100	0	-100
Pictou Island, East End	Pictou	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Pictou Island, John Dans Cove	Pictou	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Pictou Island, North Shore	Pictou	nc	0	nc	nc	0	nc	~	~	~	~	~	~
Pictou Island, North Shore	Pictou	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Pictou Island, Roger Point	Pictou	nc	0	0	nc	0	0	~	0	~	~	0	~
Pictou Island, West End	Pictou	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Pictou Island, Wharf	Pictou	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Roaring Bull Point (Sinclair's Island)	Pictou	0	0	0	0	0	0	0	0	0	0	0	0
Rushtons Park (Murray)	Pictou	0	0	0	0	0	0	0	0	0	0	0	0
Savage Point, Big Merigomish Island	Pictou	0	0	0	0	0	0	0	0	0	0	0	0
Waterside Beach Park	Pictou	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Beach Meadows	Queens	2	1	0	4	2	0	-50	-100	-100	-50	-100	-100
Carters & Wobamkek	Queens	2	1	0	4	2	0	-50	-100	-100	-50	-100	-100
Cranberry Pond	Queens	1	0	nc	2	0	nc	-100	~	~	-100	~	~
Gull Island	Queens	0	0	nc	0	0	nc	0	~	~	0	~	~
Little Port Joli Bay, KejNP	Queens	1	0	0	2	0	0	-100	0	-100	-100	0	-100

# 2001 Piping Plover Census

Table 2 Changes in abundance of Piping Plovers in Nova Scotia: comparison of results from the 1991, 1996 and 2001 International Censuses (cont.)

Site	County	No. of pairs			No. of adults			Percent change (pairs)			Percent change (adults)		
		1991	1996	2001	1991	1996	2001	1991-1996	1996-2001	1991-2001	1991-1996	1996-2001	1991-2001
Port Joli (Goose Haven)	Queens	2	0	0	4	0	0	-100	0	-100	-100	0	-100
Port Mouton Island	Queens	0	0	0	0	1	0	0	0	0	+	-100	0
Ragged Harbour	Queens	nc	1	1	nc	2	2	~	0	~	~	0	~
Sandy Bay	Queens	1	1	0	2	2	1	0	-100	-100	0	-50.0	-50
St Catherines River, KejNP	Queens	3	4	4	8	8	8	+33.3	0	+33.3	0	0	0
Summerville	Queens	3	2	2	7	4	4	-33.3	0	-33.3	-42.9	0	-42.9
Crossroads (L'Ardoise)	Richmond	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Grand Greve	Richmond	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Morrison's, Framboise	Richmond	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Point Michaud	Richmond	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Pondville	Richmond	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Rear Point Michaud	Richmond	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Rockdale	Richmond	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Rocky Bay	Richmond	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Baccaro (Crows Neck)	Shelburne	3	2	4	6	6	8	-33.3	+100	+33.3	0	+33.3	+33.3
Black Point (Mathews Lake)	Shelburne	1	0	0	3	0	0	-100	0	-100	-100	0	-100
Blanche Point	Shelburne	0	nc	0	0	nc	0	~	~	0	~	~	0
Bull's Head	Shelburne	nc	1	nc	nc	3	nc	~	~	~	~	~	~
Burks Point (Powells)	Shelburne	1	0	0	2	0	0	-100	0	-100	-100	0	-100
Clam Point	Shelburne	1	0	1	2	0	2	-100	+	0	-100	+	0
Daniels Head (Southside)	Shelburne	3	3	6	7	6	12	0	+100	+100	-14.3	+100	+71.4
Fish Island	Shelburne	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Fox Bar	Shelburne	2	2	2	4	4	4	0	0	0	0	0	0
Goose (Indian) Point	Shelburne	1	0	0	2	0	0	-100	0	-100	-100	0	-100
Inner (The Cape)	Shelburne	1	0	1	2	0	2	-100	+	0	-100	+	0
Johnstons Pond	Shelburne	1	1	1	2	3	2	0	0	0	+50	-33.3	0



## 2001 Piping Plover Census

Table 2. Changes in abundance of Piping Plovers in Nova Scotia: comparison of results from the 1991, 1996 and 2001 International Censuses (cont.)

Site	County	No. of pairs			No. of adults			Percent change (pairs)			Percent change (adults)		
		1991	1996	2001	1991	1996	2001	1991-1996	1996-2001	1991-2001	1991-1996	1996-2001	1991-2001
Louis Head	Shelburne	2	2	0	4	5	0	0	-100	-100	+25	-100	-100
Northeast Point	Shelburne	1	0	0	2	0	0	-100	0	-100	-100	0	-100
Ratcliffe Hills (The Cape)	Shelburne	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Red Head	Shelburne	1	0	1	2	0	2	-100	+	0	-100	+	0
Round Bay & Roseway	Shelburne	3	1	2	6	3	4	-66.7	+100	-33.3	-50	33.3	-33.3
Sand Hills Provincial Park (Sebim)	Shelburne	1	0	3	3	1	6	-100	+	+200	-66.7	+500	+100
Stoney Island	Shelburne	0	0	1	0	0	2	0	+	+	0	+	+
The Hawk	Shelburne	0	1	2	1	2	4	+	+100	+	+100	+100	+300
The Hawk Point	Shelburne	nc	nc	1	nc	nc	2	~	~	~	~	~	~
North Harbour	Victoria	0	0	0	0	0	0	0	0	0	0	0	0
South Harbour	Victoria	0	1	1	0	3	2	+	0	+	+	-33.3	+
Totals		8016	8016	8047	8077	8060	8097	-36.5	+30.3	-17.3	-30.1	+17.7	-17.7

nc - no census

## 2001 Piping Plover Census

Table 3. Fledging success of Piping Plovers in Nova Scotia, 2001

Site	County	No. of pairs monitored	Nesting attempts	Successful nests	No. fledged	Productivity
Mahoney's	Antigonish	2	2	2	4	2.0
Pomquet	Antigonish	3	3	3	10	3.33
Martinique	Halifax	1	1	1	4	4.0
Cherry Hill (Conrad)	Lunenburg	3	3	3	9	3.0
Oxner's Beach	Lunenburg	1	1	1	1	1.0
Bowen Island	Pictou	1	1	1	1	1.0
Carters & Wobamkek	Queens	1	1	0	0	0
Ragged Harbour	Queens	1	1	0	0	0
St Catherines River, KejNP	Queens	5	5	3	6	1.2
Summerville	Queens	2	2	2	3	1.5
Baccaro (Crow Neck)	Shelburne	4	6	4	3	0.75
Daniels Head (Southside)	Shelburne	6	10	7	6	1.0
Fox Bar	Shelburne	2	2	2	5	2.5
Johnstons Pond	Shelburne	1	2	1	1	1.0
Louis Head	Shelburne	1	1	1	0	0
Red Head	Shelburne	1	1	1	4	4.0
Round Bay & Roseway	Shelburne	3	3	3	6	2.0
Sand Hills Provincial Park (Sebim)	Shelburne	3	5	1	0	0
Stoney Island	Shelburne	1	1	0	0	0
The Hawk	Shelburne	2	3	1	3	1.5
The Hawk Point	Shelburne	1	1	1	2	2.0
South Harbour	Victoria	1	1	1	?	?
Totals		46	56	39	68 +	1.5*

\* excluding South Harbour

Table 4. Population demographics, 1996 - 2001

Year	No. of PIPL pairs	No. of PIPL adults	Productivity estimate	No. of pairs monitored <sup>1</sup>
1996*	33	79	~	
1997	40	90	1.97	36
1998	37	76	2.00	36
1999	39	96	1.51	35
2000	42	94	1.77	40
2001*	43	93	1.51	45

\* denotes International Census years

1 - includes pairs monitored that may have been discovered after International Census window

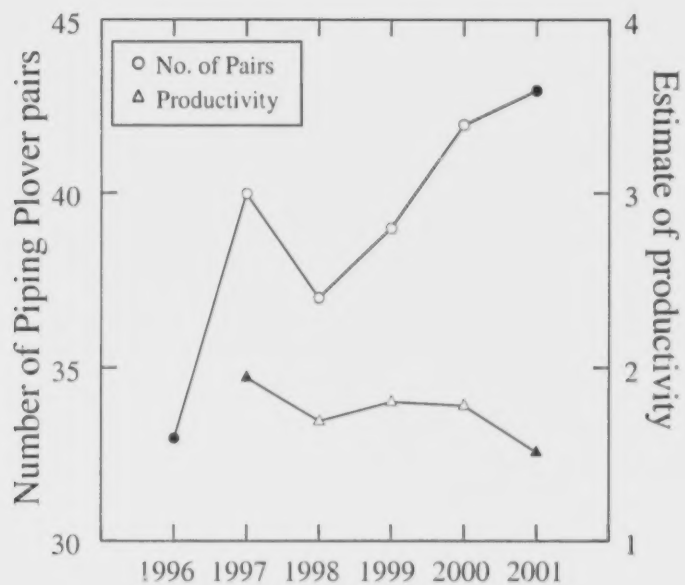


Figure 2. Piping Plover pair and productivity estimates in Nova Scotia, 1996 to 2001

## The 2001 International Piping Plover Census in Prince Edward Island

Jackie Waddell

*Island Nature Trust, P.O. Box 265, Charlottetown, PE C1A 7K4*

### Abstract

The Prince Edward Island 2001 International Piping Plover Breeding Census was conducted between June 7 and 22 using 59 trained volunteers and staff of the Island Nature Trust and the Prince Edward Island National Park of Canada (PEINP). The census covered 87 beaches, 188 kilometres, and counted 112 adult Piping Plovers on 28 beaches. Of these, 76 Piping Plovers were observed on 21 beaches outside PEINP and 36 Piping Plovers on 7 beaches inside PEINP. Survey effort has increased since 1991 and 1996. Coordinators believe the 2001 census represents the actual population as all known potential Piping Plover nesting habitat was surveyed. International censuses in 1991 and 1996 found 110 and 65 birds respectively. Increases of 2% in 2001 over 1991 and 42% over 1996 show a return to numbers of a decade ago after a large decline. Important areas for Piping Plovers are the Hog Islands chain, Cavendish Sandspit, Covehead Harbour West, Canavoy and North Rustico Sandbar. Proportionately fewer birds were found inside PEINP than in previous censuses and Piping Plovers were found on more eastern and south-eastern beaches in 2001 than in other surveys. Conservation concerns continue to be human disturbance and habitat damage. Vehicles were used on all Piping Plover beaches, but occur more regularly and most frequently in western PEI. Protection efforts have improved significantly on beaches outside PEINP and remain at a high level inside PEINP.

### Résumé

À l'Île-du-Prince-Édouard, le recensement international a eu lieu du 7 au 22 juin 2001, et il a été réalisé par 59 employés et bénévoles dûment formés du parc national de l'Île-du-Prince-Édouard et de l'Island Nature Trust. Le recensement visait 87 plages d'une superficie totale de 188 km, et il a permis de dénombrer 112 adultes sur 28 plages. De ce nombre, 76 ont été observés sur 21 plages à l'extérieur du parc national de l'Île-du-Prince-Édouard, et les 36 autres, sur sept plages du parc. Les efforts déployés pour recenser les pluviers se sont intensifiés depuis 1991 et 1996. Les coordonnateurs estiment que les résultats du recensement de 2001 sont un reflet fidèle de la population réelle, parce que les aires de nidification connues du Pluvier siffleur ont toutes été surveillées. Les recensements internationaux de 1991 et de 1996 avaient permis de dénombrer respectivement 110 et 65 oiseaux. L'augmentation de 1,8 % en 2001 par rapport à 1991 et de 42 % par rapport à 1996 témoigne d'un retour aux chiffres enregistrés il y a une décennie après une importante baisse de population. Les principaux habitats du Pluvier siffleur sont les îles Hog, la flèche Cavendish, Covehead Harbour West, Canavoy et le cordon littoral de North Rustico. Le nombre d'oiseaux dénombrés à l'intérieur du parc national de l'Île-du-Prince-Édouard a baissé proportionnellement par rapport aux recensements précédents, et les recenseurs ont trouvé des pluviers sur un plus grand nombre de plages de l'est et du sud-est en 2001 que lors des recensements antérieurs. Les perturbations et les dommages causés par les humains demeurent les principaux obstacles à la survie de l'espèce. Les véhicules circulent sur toutes les plages qui servent

## 2001 Piping Plover Census

d'habitat au Pluvier siffleur, mais ils sont surtout concentrés sur les plages de l'Ouest de l'Île. Les mesures de protection se sont accrues considérablement sur les plages situées à l'extérieur du parc national, et elles demeurent rigoureuses à l'intérieur du parc.

### Introduction

Piping Plover (*Charadrius melodus melodus*) numbers and productivity on Prince Edward Island (PEI) were sporadically recorded between 1964 and 1990. In some years, coverage was only extended to small portions of the province. Reliable census and productivity data are available for most beaches in the Prince Edward Island National Park of Canada (PEINP) since 1977. Three International Censuses in 1991, 1996, and 2001 provide information on the entire provincial population (Cairns 1978; Johnson and Feldstein 1983; MacLeod 1984; Northcott and Creamer 1987; Flemming 1992; McAskill *et al.* 1994; Walker and Waddell 1996). Province-wide monitoring efforts have included an annual 'mini-census' on beaches with a history of Piping Plover use or with suitable habitat. These smaller effort 'mini-censuses' provided information on the population in 1994 and continued each year from 1996 through 2001 (MacDonald *et al.* 2001). As the Island Nature Trust, a provincial conservation organization, gained experience and secured funding for work with Piping Plovers, protection and monitoring efforts improved to include all nesting beaches outside PEINP. The work of the Island Nature Trust has resulted in increased collection of population data and protection for nesting Piping Plovers outside PEINP, as well as an increased level of effort invested in the 1996 and 2001 International Censuses. Protection efforts include annual use of signage, symbolic fencing and a small number of predator exclosures. The beaches on Hog Island chain (Cascumpec Island, Conway Island and Hog Island) and Boughton Island are not included in this program because they are difficult to access.

In 1991, 110 Piping Plovers were found in PEI during the first International Breeding Census. The first 'mini-census' of adult Piping Plovers in PEI was conducted in 1994 because it was feared that the regional population had suffered a severe decline. In 1994 only 60 Piping Plovers were found, a decrease of 45% from 1991. Since that time the provincial population has steadily increased to 65 Piping Plovers in 1996, 67 in 1997, 79 in 1998, and 87 in 1999 and 2000. While effort in International Census Years (1991, 1996 & 2001) has been more intense than other 'interim censuses', it is believed that information collected in each interim year accurately reflects the actual population of the province since 1996.

Island Nature Trust produced a Piping Plover Atlas in 1997 of all beaches used by Piping Plovers in the province. The earliest documented accounts of Piping Plovers in PEI were from 1966. The Atlas is updated each year to include all Piping Plovers, nest attempts, eggs, hatched, and fledged chicks encountered on a beach-by-beach basis (Waddell *et al.* 2001).

Greenwich peninsula was added to PEINP in 1999, and as a result, Greenwich/Schooner beach became the jurisdiction of Parks Canada. The PEINP Piping Plover Monitoring Program has provided excellent protection and monitoring of all Piping Plovers inside PEINP boundaries since 1977. PEINP monitors provide daily monitoring and weekly counts of Piping Plovers, as well as construct predator exclosures and perform egg rescues when required (Thomas *et al.* 2001). They are also responsible for public closure of nesting areas. Population and productivity estimates are now collected annually for the entire province and the results are considered to be a good representation of the actual population and productivity.

During the International and interim annual censuses, abundant suitable habitat was available for Piping Plovers in PEI. Nearby development and increased use of coastal lands has brought more people

## 2001 Piping Plover Census

to the beaches where Piping Plovers nest. Humans and unrestrained dogs entering signed or closed areas and vehicular activity on beaches outside PEINP add to the high disturbance faced by Piping Plovers. In addition, predator pressure remains high, with fox, crows and gulls observed at all sites (MacDonald *et al.* 2001).

Habitat for Piping Plovers on PEI continues to develop and erode. Some areas have changed dramatically since 1991. North Rustico Sandbar has increased in size and developed into an excellent Piping Plover nesting beach during 1990-2001 and presently consists of over 10 ha of good Piping Plover habitat. At the same time, a beach adjacent to North Rustico Sandbar, Robinson's Island Sandspit, experienced erosion to the east and was markedly reduced in size. North Rustico Sandbar is impacted by loose dogs, many predators, frequent and persistent human use (pedestrian and some vehicular) and the many cottages and summer accommodation nearby. St. Peter's Harbour includes approximately 5 ha of dumped dredge spoils that have been used by nesting Piping Plovers in recent years, with success (Waddell *et al.* 2001).

This paper reports the results of the third International Piping Plover Breeding Census in Prince Edward Island in 2001.

### Methods

Island Nature Trust volunteered to be the provincial coordinator of the 2001 International Piping Plover Breeding Census for Prince Edward Island. A list of beaches to be censused was assembled using information collected during previous International Censuses and annual 'mini-censuses'. Also included on the list were beaches not previously censused that appeared to contain suitable Piping Plover habitat (determined from naturalist reports and topographic maps) and any sites where Piping Plovers had been reported in the past. A total of 87 beaches were selected to be censused. Four beaches (Rocky Pt., Hampton, Victoria and McAskill River) surveyed in 1991 or 1996 were not censused in 2001 because no suitable habitat was found during a visit in early spring 2001.

The dates of the census were selected as 07 to 18 June 2001 and recruitment of volunteers was conducted from April to June until each beach had 2 or more surveyors assigned. Volunteers were recruited from previous censuses, media releases, and former staff of the Island Nature Trust. The census was conducted inside PEINP by Park staff. Volunteers and staff used the same International Census guidelines throughout the province (Haig and Plissner 1993). Staff of the Nature Trust assisted volunteers on large areas which required 4 to 6 surveyors for an accurate result. Volunteers with previous census and/or Piping Plover experience were paired with those with no or little experience.

Three regional training sessions were held in May to provide volunteers with skills and materials required for the census. International Census forms, maps, identification materials and guidelines were provided to the volunteers. In each training session volunteers visited a nearby Piping Plover beach to observe suitable habitat and in two cases, observe Piping Plovers.

Volunteers were instructed on dates, census techniques, weather limitations, identification of Piping Plovers, tracking, safety, access, and equipment required for their task. Monitors visited one or more assigned beach, recorded required information directly on the International Census Individual Census Report while on-site and submitted that report and associated maps with the area censused indicated to Island Nature Trust. Surveyors also noted factors that could have potentially affected results such as disturbances, presence of predators, weather extremes.

Most beaches were censused by two or more people, with one person at the water line and the other at the base of the dunes walking parallel to one another until Piping Plovers were observed. At that

## 2001 Piping Plover Census

point the person at the dune would join the person at the water's edge and continue walking and counting Piping Plovers until the last individual was 100m behind the census participants. The participants would then separate again with one at the dunes, the other at the water. Census participants watched for Piping Plovers and their tracks, ensuring extra vigilance when tracks were observed. Where habitat was wide, and Piping Plover numbers were expected to be high at sites such as the North Rustico Sandbar and Canavoy Beach, the Island Nature Trust Piping Plover program staff assisted volunteers to reduce risk of miscounting.

All access to beaches was by foot except for off shore island beaches - Conway, Cascumpec, Hog Islands and Boughton Island where motor boats or canoes were used. The Piping Plover habitat on these island beaches was then censused on foot.

Copies of submitted census forms were sent to the Canadian Wildlife Service and kept on file by the Island Nature Trust. The original census forms were sent to the International Census coordinators in Oregon, USA. A brief narrative was completed in late 2001 for submission to the census coordinators.

## Results

The Prince Edward Island portion of the 2001 International Piping Plover Breeding Census was completed between 7-22 June 2001. All 87 beaches selected for the census were surveyed, covering 188 kilometres of Piping Plover habitat. Volunteers and staff participants totalled 59 people. Of 87 beaches censused, 79 (91%) were completed between 7-11 June and 83 (95%) between 7-14 June. The four beaches that were surveyed after June 14 (June 17 {1 beach}, June 18 {2 beaches} and June 22 {1 beach}) had no Piping Plovers (Table 1). The opportunity for Piping Plover movement between beaches during the census was reduced and accuracy of the count improved by keeping the census period as short as possible. One beach, Blooming Point (PEINP) was censused by the same Piping Plover monitor over two days (June 7 and 9) as the area to survey was very large and included a 3 km walk to get to the census area. The area traditionally used by nesting Piping Plovers in previous surveys was surveyed on June 9 and the area that did not have Piping Plovers previously was surveyed on June 7. No Piping Plovers were observed on June 7 and 5 Piping Plovers (2 pairs and one single) were reported on June 9. All other beaches were censused in a single visit.

A total of 112 adult Piping Plovers were found on 28 beaches in Prince Edward Island in 2001 (Table 1). Seven areas important to Piping Plovers hosted 5 or more adults or (1%) of the 481 adults counted in Eastern Canada during the census. These areas were Cavendish Sandspit PEINP (13), North Rustico Sandbar (13), Canavoy (13), Covehead Harbour West PEINP (9), Cascumpec Island (5), Conway Island (5) and Blooming Point PEINP (5).

The 13 PEINP beaches (Table 1) had 36 adults on 7 beaches. There were 76 adults outside PEINP boundaries on 21 beaches. Of the 45 breeding pairs identified in the census, 15 were inside PEINP boundaries and 30 outside PEINP boundaries.

Twelve (12) beaches had Piping Plovers in all three International Census years. From west to east, these were Conway Island, Hog Island, Cabot Provincial Park, Darnley Point, Cousins Pond, Cavendish Sandspit, Rustico Causeway, Covehead Harbour West, Blooming Point, Canavoy, St. Peter's Lake Run, and South Lake. Most (9) of these beaches are on the north shore in the central area of the province. No Piping Plovers were found on the 13 beaches added to the International Census for the first time in 2001. These beaches were included in the 2001 census because Piping Plovers had been observed on them between the 1996 and 2001 International Censuses or suitable habitat had developed or was discovered. Most of these beaches were small coves at the mouth of streams and had small amounts of



## 2001 Piping Plover Census

suitable habitat. No Piping Plovers were found during the 2001 census on the 15 beaches that had not been included in previous censuses. Since 1991, 30 additional beaches are now included in the census. Fifteen Piping Plovers were found on two of the beaches (North Rustico Sandbar (13 adults) and Black Pond (2 adults)) not previously included in census efforts. During the 2001 census, 8 beaches had more adults and 12 beaches had fewer adults than in 1991. In comparison to the 1996 census, 14 beaches had more birds in 2001, and 11 beaches had fewer birds.

No adverse weather conditions were reported for the census period that may have destroyed Piping Plover nests or altered habitat. Weather conditions during surveys were within the guideline parameters. Winds were reported to be between 0 and 40 km/hr, temperature between 10°C and 20°C and precipitation in the form of showers was only reported only during the Cape Traverse survey, a south shore area with very poor habitat, and no Piping Plovers.

Signs of disturbance were reported at 28 sites and included human activities, vehicles on the beach, dogs, predators and the presence of gulls. Vehicles were reported on the beach at Barachois Run, Foley's Pond (the Gap), Little Miminegash, Miminegash, Beach Point and Schooner Pond. Vehicle tracks were also reported at Cedar Dunes Park, Cedar Dunes West, Basin Head, Condon's Pond, Graham's Pond, Howe Bay, Launching, Naufrage, Old Ferry Spit (Boughton Bay), Priest Pond and Savage Harbour West. Sand mining activities were reported for Gasgoine Cove West. Predators or their tracks (red fox, bald eagle & gulls) were reported at six beaches and pedestrian use (presence or their tracks, including dogs) was noted at ten sites. The surveyor at Wood Islands reported that a person and dog walked down the beach just ahead of the surveyors, an event that could have affected results. Piping Plovers were not observed at this site during the present survey, nor have any been observed during previous surveys.

## Discussion

In Prince Edward Island, 112 adults or 23% of the total Eastern Canada estimate of 481 Piping Plovers were counted during the 2001 International Breeding Census. Census results show a slight increase (2%) in the provincial population compared to 1991 (110 adults) and a significant increase (42%) compared to 1996 (65 adults).

Of the 87 beaches surveyed in 2001, 55 (63%) were censused in all three Census years and 72 (83%) were censused in both 1996 and 2001. Census effort has increased from 57 beaches in 1991 to 74 beaches in 1996 and to 87 beaches in 2001. Portions of beaches censused in previous years that were deemed unsuitable were not visited. Therefore, despite the increased number of beaches surveyed, the number of kilometres covered was comparable in all three censuses: 191 km in 1991, 180 km in 1996 and 188 km in 2001. The 2001 census covered 42 km of Piping Plover habitat on 30 beaches not censused in 1991 and 20 km on 15 beaches not censused in 1996. Overall, more potential or suitable habitat was censused in 2001 than in previous censuses.

Of the 12 beaches with Piping Plovers in all three International censuses, only two (St. Peter's Lake Run and Cousin's Pond) have had the same number of Piping Plovers in all three years. Large changes in numbers have occurred between International Census years at 17 beaches. Seven of these sites are eastern and south-eastern beaches with Piping Plovers reported for the first time in an International Census. The largest changes were at North Rustico Sandbar (not censused in 1991, 4 Piping Plovers in 1996 and 13 in 2001) and Blooming Point (16 adults in 1991, 1 in 1996 and 5 in 2001).

In 2001, Piping Plovers were more widely dispersed across the Province and distribution differed from that of previous International Censuses. A larger proportion (68%) of the provincial Piping Plover



## 2001 Piping Plover Census

population occurred outside PEINP than in past censuses. Prince Edward Island National Park supported 42% of the total population in 1991 and 45% in 1996. Therefore, the majority of the Provincial population does not currently receive the high level of protection associated with Park regulations. However, efforts to monitor and protect Piping Plovers outside PEINP boundaries have improved in recent years.

The distribution of Piping Plovers in PEI has shifted since the 1991 census (Figure 1). Eastern and south-eastern beaches (Kings County) have had more adults and western beaches (Prince County) have had fewer since 1991. Annual surveys between 1996 and 2001 confirm this shift in distribution. In eastern and south-eastern PEI, 7 beaches surveyed during all three censuses reported Piping Plovers for the first time in 2001.

Two previously used beaches (Nail Pond and Jacques Cartier) in western PEI were abandoned in 2001, possibly due to increased vehicular traffic. However, one new beach (Cascumpec Island) was occupied for the first time during the 2001 census. The Hog Island chain continues to have the majority of adults in the western area, however the number has declined since 1991. Since these are difficult to access, nesting beaches on this barrier island chain are less disturbed by human related activities. These islands have extensive areas of suitable habitat but for unknown reasons Piping Plover use has never reported.

In central PEI (Queens County), Piping Plovers were found on 36 beaches. The highest proportion of Piping Plovers in PEI continues to be found at Blooming Point, Greenwich, Cavendish Sandspit, Covehead Harbour West and the North Rustico Sandbar. Although population fluctuations have occurred here, these beaches have been consistently occupied by Piping Plovers since the 1991 census.

Two sites, Canavoy (Kings County) and Cavendish Sandspit PEINP (Queens County), have sustained nine or more Piping Plovers in each International Census. These sites consistently provide suitable breeding and feeding habitats, as storms frequently overwash the dune and enhance habitat quality on the long, wide sandspits and associated salt marsh and bay side feeding areas. The Cavendish Sandspit is located in PEINP, therefore under the National Parks Act, vulnerable areas are normally closed to the public during the breeding season (Parks Canada 1997). Canavoy was designated as an Important Bird Area (IBA) in 2000 for the protection of Piping Plovers. The Canavoy and area IBAs; (Savage Harbour West, Canavoy, St. Peter's Lake Run, St. Peter's Harbour and Greenwich peninsula {excluding Schooner Pond}) had 19% of the province's nesting birds and 4% of the Atlantic Canada population, a greater proportion than in previous censuses (17% in both 1991 and 1996). While the IBA designation does not provide formal protection, it does heighten the awareness of the sites and further strengthens the argument for formal protection by government agencies.

Since the 1996 International Census, protection and monitoring efforts for Piping Plovers on their breeding grounds have increased and continue to improve in PEI. If support (both financial and public) is maintained, the species will be protected at each nesting beach. The PEI Wildlife Conservation Act (1998) is the provincial legislation protecting wildlife, including Piping Plover. This legislation also enables the identification and protection of species at risk and their habitat. The regulations for this act are in the process of being developed and the regulations for the former Fish and Game Act are used in the interim.

### **Acknowledgements**

The 2001 International Piping Plover Breeding Census in Prince Edward Island was supported by generous contributors: financial and volunteer. Support for this project was made possible by the James L. Baillie Memorial Fund of Bird Studies Canada and the Long Point Bird Observatory with funds raised through the annual Baillie Birdathon, World Wildlife Fund and Canadian Wildlife Service (Environment Canada) Endangered Species Recovery Fund, Government of Canada's Species at Risk Habitat Stewardship Program, the PEI Wildlife Conservation Fund, the Province of Prince Edward Island, Island Nature Trust, Prince Edward Island National Park. Peter McIntyre, Linda Thomas, Barb McDonald, Tracy MacDonald, Gaylene Sanderson, Wade Lewis, Jennifer Stewart, Verna Docherty, Brian Ashby, Paul Ayles and over 50 volunteer census participants across PEI and the beach-going public who respect protection efforts and reduce disturbance to Piping Plovers in Prince Edward Island are owed a debt of gratitude for their assistance, generosity, foresight and efforts to the recovery of Piping Plovers.

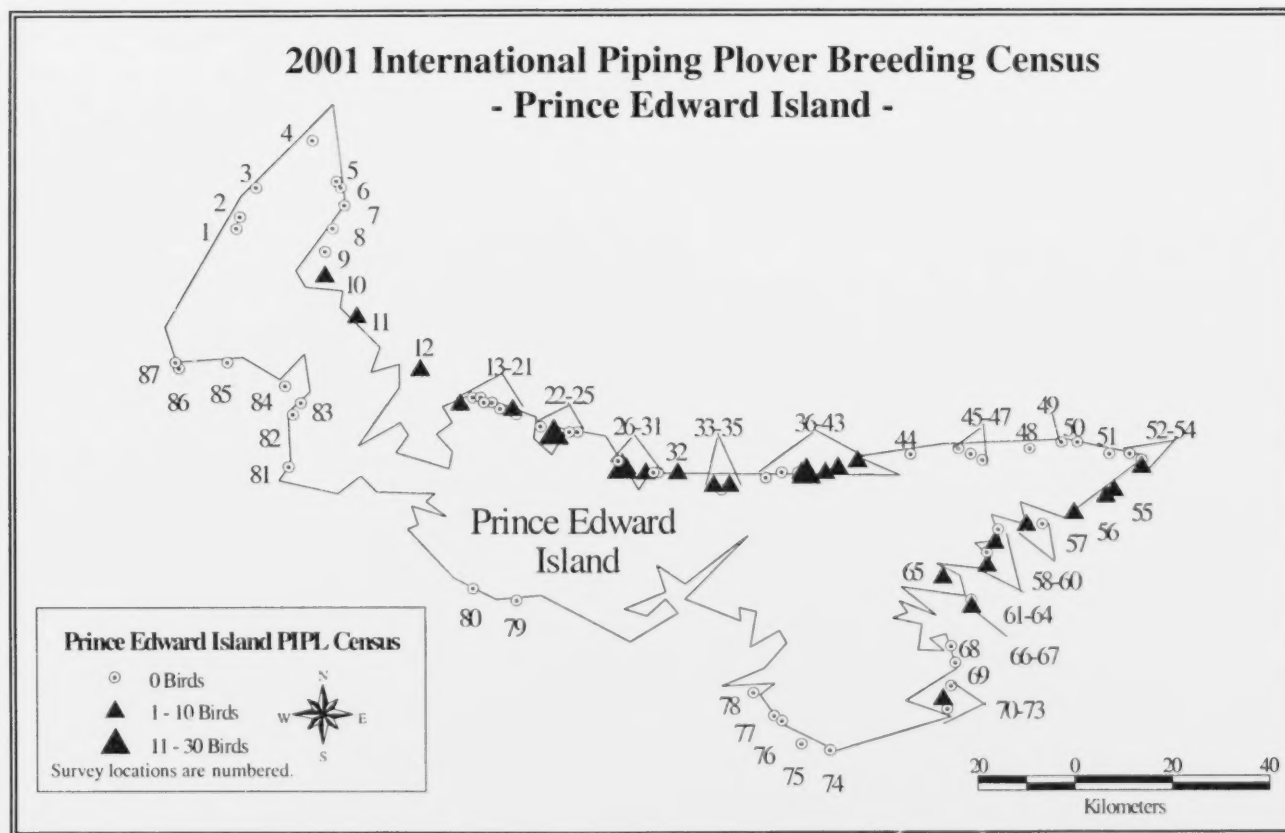


Figure 1: Distribution of Piping Plover in Prince Edward Island during 2001 census.

Table 1. Results of 2001 International Piping Plover Breeding Census in Prince Edward Island

Map #	Site	County	1:50,000 NTS Map Sheet	Date	2001 census					91 census	96 census
					No. of pairs	No. of adults	No. of observers	Distance surveyed (km)	No. of hours		
56	Basin Head	Kings	11L/8	08 June	1	4	2	5	1.83	Yes	Yes
73	Beach Point	Kings	11L/1	10 June	0	0	1	1.2	0.67	Yes	Yes
57	Black Pond	Kings	11L/8,11K/5	09 June	1	2	2	2	2	No	Yes
67	Boughton Island	Kings	11L/1	09 June	1	2	2	4	3.5	Yes	Yes
44	Cable Head	Kings	11L/7	11 June	0	0	2	1	0.5	Yes	Yes
50	Campbells Cove	Kings	11K/5	07 June	0	0	2	1	0.73	No	No
39	Canavoy	Kings	11L/7	09 June	5	13	2	3.5	2.08	Yes	Yes
71	Condon's Pond	Kings	11L/2	11 June	0	0	2	3	2	No	No
45	Cow River	Kings	11L/8,11K/5	09 June	0	0	2	0.5	0.83	Yes	No
48	Cross River	Kings	11L/8,11K/5	09 June	0	0	2	1	1	Yes	Yes
54	Diligent Pond	Kings	11L/8,11K/5	07 June	1	3	1	1	1.25	Yes	Yes
52	East Lake	Kings	11L/8,11K/5	07 June	0	0	2	2	3	Yes	Yes
53	East Point	Kings	11L/8,11K/5	07 June	0	0	2	1.2	3	No	No
62	Eglinton Cove	Kings	11L/8,11K/5	07 June	1	2	1	1	1	Yes	Yes
61	Fortune Beach	Kings	11L/8,11K/5	09 June	0	0	2	2	0.75	No	No
70	Graham's Pond	Kings	11L/2	11 June	0	0	1	1.5	0.67	No	No
43	Greenwich/Schooner PEINP	Kings	11L/7	09 June	1	2	2	6	4.5	Yes	Yes
63	Howe Bay	Kings	11L/8,11K/5	11 June	0	0	1	2	1	Yes	Yes
66	Launching Point	Kings	11L/1	10 June	0	0	1	1	1	Yes	Yes
	McAskill River	Kings	11L/7	nc	nc	nc	nc	nc	nc	Yes	Yes
46	Naufrage	Kings	11L/8,11K/5	08 June	0	0	2	1	0.5	Yes	Yes
58	Norris Pond	Kings	11K/5,11L/8	09 June	0	0	2	0.8	0.17	No	No
51	North Lake	Kings	11L/8,11K/5	07 June	0	0	2	0.5	3	Yes	Yes
65	Old Ferry Spit (Boughton Bay)	Kings	11L/1	11 June	1	2	1	2.25	1.5	Yes	Yes
68	Pamure Island	Kings	11L/1	07 June	0	0	2	2.5	1.08	Yes	Yes
38	Pigots Pond	Kings	11L/7	08 June	0	0	2	1	0.57	No	No

## 2001 Piping Plover Census

Table 1. Results of 2001 International Piping Plover Breeding Census in Prince Edward Island (cont.)

Map #	Site	County	1:50,000 NTS Map Sheet	Date	2001 census					91 census	96 census
					No. of pairs	No. of adults	No. of observers	Distance surveyed (km)	No. of hours		
72	Poverty Beach	Kings	11L/1	10 June	1	2	4	2	1.92	Yes	Yes
49	Priest Pond	Kings	11L/8,11K/5	07 June	0	0	2	1	0.57	Yes	Yes
47	Saint Margarets	Kings	11L/8,11K/5	09 June	0	0	2	1.75	0.83	No	Yes
40	Savage Harbour West	Kings	11L/7	08 June	1	2	2	0.25	0.33	Yes	Yes
60	Sheep Pond	Kings	11K/5,11L/8	09 June	0	0	2	0.5	0.5	No	No
59	Souris Causeway	Kings	11L/8,11K/5	09 June	1	3	2	1	1.5	Yes	Yes
55	South Lake	Kings	11L/8,11K/5	09 June	1	2	2	5	2	Yes	Yes
64	Spry Cove	Kings	11L/8,11K/5	13 June	0	1	1	2.25	1.5	Yes	Yes
42	St Peter's Harbour	Kings	11L/7	09 June	2	4	2	2.5	1.5	Yes	Yes
41	St. Peter's Lake Run	Kings	11L/7	09 June	1	2	2	1.5	1.83	Yes	Yes
69	Steeles Pond	Kings	11L/2	09 June	0	0	2	1	0.92	No	No
82	Barachois Run	Prince	21I/9	09 June	0	0	4	2	1.5	Yes	Yes
3	Black Pond West	Prince	21I/16,11L/13	07 June	0	0	2	1	0.33	No	Yes
14	Cabot Provincial Park	Prince	11L/12	10 June	1	2	1	1.5	1.08	Yes	Yes
80	Cape Traverse	Prince	11L/4	18 June	0	0	2	2	1	Yes	Yes
10	Cascumpec Island	Prince	21I/16,11L/13	14 June	2	5	2	2	1.33	Yes	Yes
86	Cedar Dunes Park	Prince	21I/9	11 June	0	0	2	2	5.2	Yes	Yes
87	Cedar Dunes West	Prince	21I/9	11 June	0	0	2	3	0.42	Yes	Yes
11	Conway Island	Prince	11L/12	14 June	1	5	2	3	4.25	Yes	Yes
13	Darnley Point	Prince	11L/12	09 June	0	1	3	1	0.75	Yes	Yes
8	Foley's Pond (The Gap)	Prince	21I/16,11L/13	08 June	0	0	1	1.9	1	No	Yes
84	Grand Dique Point	Prince	21I/9	17 June	0	0	2	1	1.25	No	No
83	Higgins Wharf	Prince	21I/9	09 June	0	0	4	2	1	No	No
12	Hog Island	Prince	11L/12	14 June	2	4	4	3.5	2.42	Yes	Yes
85	Indian Point Sand Hills	Prince	21I/9	22 June	0	0	3	4.7	3.25	Yes	Yes
9	Jacques Cartier East	Prince	11L/13	08 June	0	0	1	6	3	Yes	Yes
7	Kildare Capes	Prince	21I/16,11L/13	08 June	0	0	1	2.6	1.5	Yes	Yes
1	Little Miminegash	Prince	21I/16,11L/13	07 June	0	0	2	1	0.33	No	Yes

Table 1. Results of 2001 International Piping Plover Breeding Census in Prince Edward Island (cont.)

Map #	Site	County	1:50,000 NTS Map Sheet	Date	2001 census				No. of hours	91 census	96 census
					No. of pairs	No. of adults	No. of observers	Distance surveyed (km)			
81	Maximeville	Prince	21I/8	09 June	0	0	4	2	1.5	No	Yes
2	Miminegash Pond	Prince	21I/16,11I/13	07 June	0	0	2	1.5	0.5	Yes	Yes
16	Morrisons Pond	Prince	11I/12	09 June	0	0	2	1.5	0.5	No	Yes
4	Nail Pond	Prince	21P1,11M/4	07 June	0	0	2	3	0.78	Yes	Yes
15	Profit's Point	Prince	11I/12	09 June	0	0	3	1.5	0.5	No	Yes
6	Round Pond	Prince	21I/16,11I/13	07 June	0	0	2	2.4	2	No	Yes
5	Tignish Shore	Prince	21I/16,11I/13	07 June	0	0	2	2.6	2	Yes	Yes
17	Adam's Cottages	Queens	11I/12	09 June	0	0	2	1.5	0.5	No	No
18	Adam's Pond	Queens	11I/2	11 June	0	0	2	1	0.5	No	Yes
75	Bell Point	Queens	11E/15	10 June	0	0	1	1.5	0.83	Yes	Yes
35	Blooming Point PEINP	Queens	11I/6,11I/7	07 & 09 J	2	5	3	7.5	7.33	Yes	Yes
31	Brackley Main PEINP	Queens	11I/6	09 June	0	0	1	1.2	0.25	Yes	Yes
19	Brandors Pond	Queens	11I/12	08 June	0	0	2	1	1	No	Yes
20	Campbell's Pond	Queens	11I/12	09 June	0	0	3	1	1	No	Yes
25	Cavendish Campground PEINP	Queens	11I/6	08 June	0	0	1	1.1	0.42	No	Yes
24	Cavendish Main PEINP	Queens	11I/6	08 June	0	0	2	1.1	0.67	No	Yes
23	Cavendish Sandspit PEINP	Queens	11I/6	08 June	6	13	2	10	3.5	Yes	Yes
21	Cousin's Pond	Queens	11I/12	09 June	1	2	3	2	2	Yes	Yes
32	Covehead Harbour West PEINP	Queens	11I/6	09 June	4	9	1	3.5	1	Yes	Yes
36	Deroche Pond	Queens	11I/7	08 June	0	0	2	5	1.92	Yes	Yes
37	Feehan's Point	Queens	11I/77	07 June	0	0	2	1.8	0.58	No	No
76	Gascoine Cove East	Queens	11I/2	10 June	0	0	2	1	0.5	Yes	Yes
77	Gascoine Cove West	Queens	11I/2	10 June	0	0	2	2	0.58	Yes	Yes
	Hampton	Queens	11I/3	nc	nc	nc	nc	nc	nc	Yes	Yes
26	North Rustico Beach PEINP	Queens	11I/6	08 June	0	0	2	1	1	No	Yes
27	North Rustico Sandbar	Queens	11I/6	10 June	5	13	3	1	1.83	No	Yes
78	Pond Point	Queens	11I/2	10 June	0	0	2	0.9	0.42	Yes	No

Table 1. Results of 2001 International Piping Plover Breeding Census in Prince Edward Island (cont.)

Map # Site	County	1:50,000 NTS Map Sheet	Date	2001 census					91 census	96 census
				No. of pairs	No. of adults	No. of observers	Distance surveyed (km)	No. of hours		
28 Rustico Causeway PEINP	Queens	11L/6	09 June	2	4	1	2.3	1	Yes	Yes
29 Rustico Island Sandspit, PEINP	Queens	11L/6	09 June	1	2	1	1.2	0.92	Yes	Yes
30 Shaw's Beach PEINP	Queens	11L/6	09 June	0	0	1	1.2	0.25	Yes	Yes
33 Tracadie Beach-Covehead East	Queens	11L/6	09 June	0	1	1	8.8	2.5	Yes	Yes
34 Tracadie Sandbar PEINP	Queens	11L/6	10 June	0	0	2	2	1	Yes	Yes
79 Tryon River	Queens	11L/4	18 June	0	0	2	1	0.67	No	Yes
Victoria	Queens	11L/3	nc	nc	nc	nc	nc	nc	Yes	Yes
74 Wood Islands	Queens	11E/15	10 June	0	0	4	3	1.17	Yes	Yes
22 Yankee Beach	Queens	11L/12	09 June	0	0	3	2	1	No	Yes
Totals				46	112	174	188	123.3		

\* nc = no census

Table 2. Census years and Prince Edward Island beaches with Piping Plovers

Year	No. of beaches surveyed	No. of beaches with plovers	No. of adults
1991*	57	20	110
1994	29	15	60
1996*	74	19	65
1997	35	14	67
1998	33	16	79
1999	45	19	87
2000	42	22	87
2001	87	28	112

Data compiled from Island Nature Trust files and McAskill et al. (1994)

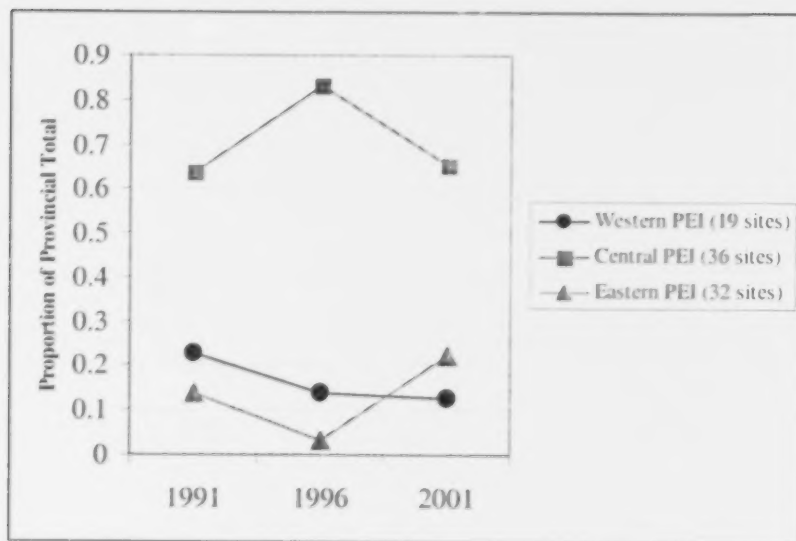


Figure 2. Proportion and distribution of Piping Plovers in PEI, 1991 to 2001.



## The 2001 Piping Plover census in New Brunswick

Diane L. Amirault and Julie McKnight

Canadian Wildlife Service, Atlantic Region, 17 Waterfowl Lane, Sackville, New Brunswick E4L 1G6

### Abstract

In New Brunswick, 66 beaches were surveyed during the 2001 International Piping Plover Census between 5 and 20 June. A total of 167 Piping Plovers (*Charadrius melodus melodus*) (including 79 pairs) were counted at 30 sites. The 30 occupied sites were located in the following counties: Gloucester (14), Kent (8), Northumberland (7) and Westmorland (1). This represents a 14% increase from 1996 (146 adults) and a 17% decrease since 1991 (203 adults). The provincial population appears to be stabilising, since a decrease of 28% had been reported between 1991 and 1996. To gather nesting and fledging productivity data, 30 sites were intensively monitored. Productivity was 1.85 chicks fledged per pair.

Human disturbance and illegal vehicular use of beaches continue to threaten Piping Plovers and are the major cause of unsuccessful nesting attempts at a number of sites. Coastal Guardian Programs and other conservation efforts directed towards Piping Plovers have decreased human disturbance on certain nesting beaches and have likely resulted in population increases at some sites.

### Résumé

Au Nouveau-Brunswick, le recensement international de 2001 a eu lieu du 5 au 20 juin, et il a porté sur 66 plages. Au total, 167 pluviers (dont 79 couples) ont été dénombrés dans 30 sites – 14 sites dans le comté de Gloucester, huit dans le comté de Kent, sept dans le comté de Northumberland et un dans le comté de Westmorland. Les résultats représentent une hausse de 14,4 % par rapport à 1996 (146 adultes) et une baisse de 17,7 % par rapport à 1991 (203 adultes). La population de la province semble se stabiliser, puisque une réduction de 28,1 % fut observée entre 1991 et 1996. Les recenseurs ont soumis 30 plages à une surveillance intensive, et ils ont recueilli des données sur la nidification et sur la productivité des nids jusqu'au premier envol. À l'échelle de la province, cette productivité se chiffrait à 1,85 oisillons envolés par couple.

Les perturbations d'origine humaine et la circulation illégale de véhicules sur les plages demeurent des menaces pour le Pluvier siffleur, et elles figurent parmi les principales causes des échecs de nidification à un certain nombre d'endroits. Les programmes des protecteurs côtiers et les autres travaux de conservation ont réduit les perturbations humaines sur certaines plages et ont probablement engendré une croissance des populations de Pluviers siffleurs à certains endroits.

### Introduction

Coastal areas and the species that reside in them are subjected to increasing pressure in New Brunswick from development, human recreational activities and heavy predation pressure. Progress for the protection of Piping Plovers (*Charadrius melodus melodus*) in New Brunswick since the last International Census has been made through federal, provincial and non-governmental efforts. Most beaches in New Brunswick are now protected by Beach Guardian Programs. The Piper Project, a special project of the New Brunswick Federation of Naturalists, has provided a Coastal Guardian Program along the Acadian Peninsula from Caraquet to Miscou to Neguac since 1985. The Piper Project delivers conservation programs for Piping Plover in the Acadian Peninsula where more than 70% of the New Brunswick population occurs. The Beach Guardian Program at La Dune de Bouctouche began in 1999

with the initiation of Piping Plover surveys. Beach Guardians from the Irving Eco-Centre concentrate their efforts at the Bouctouche Dune (La Dune de Bouctouche), but also monitor other beaches including the Escuminac beaches, Chockpish and the South Richibucto Dune.

Guardians are typically involved with surveys and beach monitoring, and participate in public education and community awareness programs. They provide information to the beach-going public about the sensitive nature of beaches and how their activities can harm wildlife and damage habitat. Coastal guardians also set up warning and educational signs in many sensitive areas, and fence off nesting areas from people and predators where necessary. The goal of the Coastal Guardian program is to minimise human disturbance of nesting areas and potential breeding grounds.

Kouchibouguac National Park of Canada (KNP) has continued their intensive Piping Plover conservation efforts within park boundaries. The Canadian Wildlife Service has increased monitoring efforts at Portage Island National Wildlife Area. Due to the remoteness of the site, human use is thought to be minimal and therefore intensive conservation measures not essential.

Here, results of the 2001 New Brunswick Provincial Census and the outcome of monitoring efforts by volunteers and staff of the Piper Project, La Dune de Bouctouche/Irving Eco-Centre, Kouchibouguac National Park and Canadian Wildlife Service-Atlantic Region are provided.

### Methods

Potential census locations were identified based on 1991 and 1996 census lists and results. Information on beach suitability arising from the 1996 census, and observations reported since then, were used to add and remove sites from the list. A total of 39 individuals spent over 110 hours surveying 66 sites for the 2001 census. Of the sites surveyed, ten were new sites not visited in either the 1996 or 1991 censuses. One site surveyed in the previous census was not revisited. The same techniques as in previous censuses were used to gather information while minimising the potential for disturbing nesting birds (Chiasson *et al.* 1994).

Surveyors received a package containing a list of beaches, Piping Plover census sheets and information and guidelines sent by the New Brunswick Provincial Coordinator (Diane Amirault). Participants were associated with the Piper Project, La Dune de Bouctouche/Irving Eco-Centre, the Canadian Wildlife Service, KNP, the New Brunswick Department of Natural Resources & Energy and members of the general public.

In addition to counts of adults which are the focus of the official census, nesting data was gathered by volunteers and staff of the Piper Project, KNP, La Dune de Bouctouche/Irving Eco-Centre, and the Canadian Wildlife Service. Productivity was calculated as the number of fledged young per pair monitored on a given beach.

### Results

The International Census was completed in New Brunswick between 05 to 20 June 2001 (Table 1). No Piping Plovers were present at either of the two sites surveyed outside the census period; Île Pokesudie in Gloucester County which was surveyed on 20 June and the northern end of Middle Miscou Beach, visited on 12 July. Reported weather conditions for surveys were satisfactory, with almost all counts (88 %) conducted under clear or partly cloudy skies with calm or moderate breezes.

During the 2001 census, 167 Piping Plovers (79 pairs) were counted at 30 sites. The distribution of sites was 14 in Gloucester County, 8 in Kent, 7 in Northumberland and 1 site in Westmorland County (Figure 1). Limited, unsuitable or minimal nesting habitat was reported at 12 of the 66 beaches surveyed. All known suitable habitat in the province was surveyed during the census window with the exception of the northern end of Middle Miscou Beach and Île Pokesudie. These sites could not be surveyed due to difficulties in accessing the areas.

The distribution of Piping Plovers in 2001 changed somewhat from previous censuses. Several beaches occupied in 1991 and/or 1996 were abandoned in 2001. These 11 beaches were Chiasson Office, Lac Frye,

Little Cape, Miscou Beach, Petit Barachois, Pigeon Hill Beach, Pointe-Sapin Beach, Preston Beach, South Richibucto Beach, Waterside Beach and Wilson Point South (Sandy Point) (Table 2). Ruisseau Chenière and South Richibucto Dune, had more Piping Plovers than during the last International Census.

The sites with the most Piping Plovers were Tracadie Sandspit/Dune (22), Tabusintac Spit (17), Neguac (12), Dune de Bouctouche (11), Pointe Verte (10), Blacklands Spit (8), Cedar Road Spit (8), Grand Passage (8), Pointe à Bouleau (8), and Portage River Dune (KNP) (8). KNP continues to provide habitat for a significant proportion of the provincial population. The census confirmed that 19 adults were present representing approximately 17% of the provincial total. Productivity at KNP was high with 20 chicks fledged or 2.22 chicks fledged per pair. The majority (83%) of the New Brunswick Piping Plover population is found on non-federal land.

During 2001, 30 sites were intensively monitored to gather nesting and fledging productivity data (Table 3). Investigators followed nesting pairs until nest failure was determined or fledging of young was confirmed at 25 days or when young were observed in sustained (>15 m) flight. The fledging success at South Richibucto Dune was unknown, and so productivity was calculated for 29 sites. Province-wide, 81 pairs were monitored with 108 chicks were produced for a provincial productivity rate of 1.85 chicks fledged per pair.

### Discussion

Ten new sites were surveyed during 2001, with two pairs being observed within these areas. During 1991, surveys were conducted along 172 km of coastline at 49 sites. In 1996, surveys were conducted along 213 km at 55 sites and in 2001 surveys were conducted along 302.5 km at 66 sites.

The population estimate for the 2001 census increased to 167 adults (79 pairs) from the 1996 estimate of 146 (65 pairs), however it remains lower than the 1991 estimate of 203 individuals (91 pairs). This represents a 14% increase from 1996 and an 18% decrease since 1991.

All known areas with suitable habitat in the province were surveyed. There were no adverse weather or disturbance factors that would have influenced the results obtained on a provincial scale and survey techniques were consistent. Therefore, we are confident that the results accurately reflect the status of the New Brunswick Piping Plover population.

Changes to Piping Plover distribution are likely related to varying habitat availability at some sites. Certain sites have become unsuitable due to succession or erosion (such as Tern Island where habitat has eroded) while other sites have become more suitable due to winter storms and subsequent removal of vegetation (such as Grand Passage, where habitat has increased on the northern end). Predation of eggs and chicks continues to be a major problem, however the influence of predation on affecting distribution is difficult to establish. It is possible that some of the beaches which are now abandoned still possess suitable habitat, however incompatible human activities (i.e. illegal vehicle traffic) make these areas unavailable for nesting birds.

Productivity at 21 of the 29 nesting beaches monitored was greater than the 1.5 chicks fledged per pair objective for the component of the Canadian Piping Plover recovery plan (Goossen *et al.* 2002). No successful nests were encountered on Plover Ground South, Val Comeau, Lac Frye and Cape Jourimain National Wildlife Area. Low productivity was observed at Grande Plaine, Pointe Verte, Tracadie Sandspit and Neguac Spit North, where only 9 chicks fledged although 20 pairs nested. Tracadie Sandspit/Dune and Pointe Verte were important sites for Piping Plovers (11 pairs and 5 pairs, respectively) however only five chicks and one chick fledged (respectively) at these sites. A high storm tide was suspected to be the cause of low productivity at these two beaches, however chicks were primarily lost due to unknown factors. The most likely cause of loss was predation by crows or foxes, which are often difficult to confirm. High productivity at other beaches compensated for this low productivity and resulted in a provincial average of 1.85 chicks fledged per pair.

Human disturbance and illegal vehicular use of beaches continue to threaten Piping Plovers and are a major cause of unsuccessful nesting attempts at a number of sites from Miscou to Green Point. The influence of predation on productivity continues to be poorly understood. Predation may account for chick loss which is not explained by other causes. Coastal Guardian Programs and other conservation efforts directed towards Piping

Plovers have decreased human disturbance on certain nesting beaches and have likely influenced population increases at some sites (i.e. Bouctouche Bar and sites in the Acadian Peninsula). The continuation of Coastal Guardian Programs that implement public education programs, erect symbolic fencing and signs and aim to reduce disturbance at nesting sites is key to the recovery of Piping Plovers in New Brunswick and Atlantic Canada.

### Acknowledgements

Many thanks are extended to personnel and volunteers from the Piper Project, La Dune De Bouctouche/Irving Eco-Centre, Canadian Wildlife Service-Atlantic Region, Kouchibouguac National Park, the New Brunswick Department of Natural Resources & Energy and other individual (non-associated) volunteers who participated in the Census and/or in collecting productivity data. These are: Diane Amirault, Robert Arseneau, Ivy Austin, Geoff Baird, Melissa Basque, Maryse Bourgeois, Andrew Boyne, Diana Brideau, Eric Brideau, Paul Chamberland, Roland Chiasson, Cynthia Chiasson, Nadia Comeau, Marcel David, Luc DeRoche, Sabine Dietz, Patrick Doucet, Rachel Friolet, Rachel Gautreau, Valérie Godbout, Julie Haché, Paul-Emile Hebert, Gregory Juppet, Joe Kennedy, Annick Lajoie, Carole LeBlanc, Patrice LeClair, Larry MacDonnell, Dave MacDonnell, Karen Anne Mallet, Bernard Martin, Léa Olsen, Lewnanny Richardson, Nadine Robichaud, Kenneth Savoie, Marc-André Savoie, Philippe Savoie, Martin Tuchscherer and Weldon Ward.

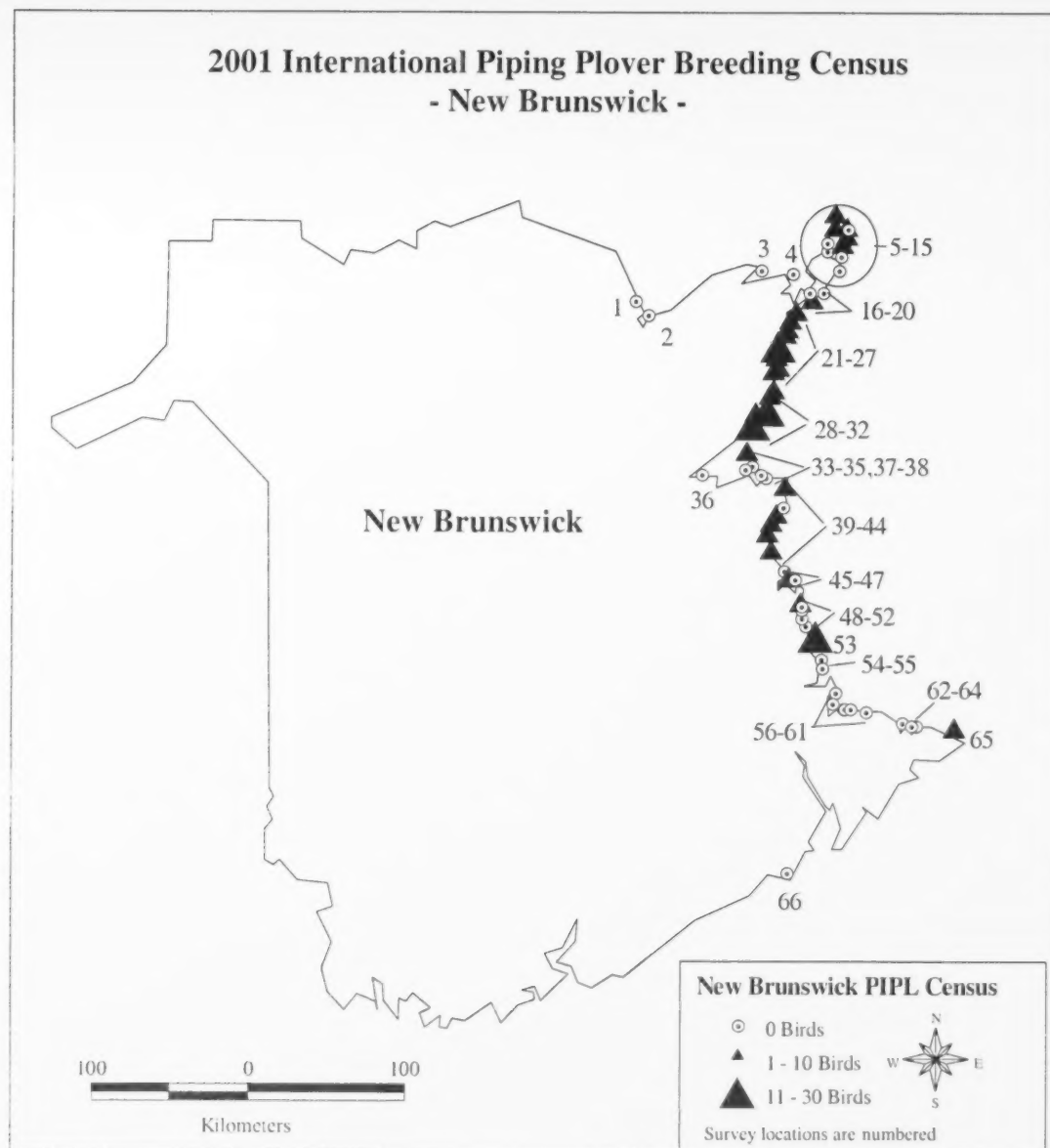


Figure 1. Distribution of Piping Plover in New Brunswick during 2001 census.

## 2001 Piping Plover Census

Table 1. Results of 2001 International Piping Plover Breeding Census in New Brunswick

Map #	Site	County	1:50,000 NTS Map Sheet	Date	2001 census					91 census	96 census
					No. of pairs	No. of adults	No. of observers	Distance surveyed (km)	No. of hours		
1	Beresford	Gloucester	21P/12	09 June	0	0	1	2.5	1.75	No	Yes
2	Carron Point	Gloucester	21P/12	09 June	0	0	1	1.0	1.50	Yes	Yes
3	Dune de Maisonette	Gloucester	21P/15	11 June	0	0	1	6.0		Yes	Yes
4	Ile Pokesudie	Gloucester	21P/15,16;22A1,2	20 June	0	0	1	1.0		No	No
5	Mark's Point (Miscou Island)	Gloucester	21P/15,16& 22A1,2	15 June	0	0	1	1.0	1.00	Yes	Yes
6	Miscou Centre Beach	Gloucester	21P/15,16;22A1,2	15 June	0	0	3	3.0		Yes	Yes
7	Ruisseau Chenière	Gloucester	21P/15,16;22A1,2	15 June	1	2	3	8.0		Yes	Yes
8	Grande Plaine & Lac Frye	Gloucester	21P/15,16;22A1,2	15 June	1	4	3	8.0	2.08	Yes	Yes
9	Miscou Beach	Gloucester	21P/15, 16;22A1,2	15 June	0	0	3	4.0	1.00	Yes	Yes
10	Wilson Point North	Gloucester	21P/15,16;22A1,2	15 June	2	4	3	4.0	2.50	Yes	Yes
11	Middle Miscou Beach	Gloucester	21P/15,16;22A1,2	15 June	1	2	4	4.0		Yes	Yes
12	Wilson Point South/Sandy Point	Gloucester	21P/15,16;22A1,2	15 June	0	0	3	4.0	1.00	Yes	Yes
13	Pigeon Hill Sandspit (Fox Den)	Gloucester	21P/15,16;22A1,2	16 June	1	2	2	5.0	2.50	Yes	No
14	Pigeon Hill Beach	Gloucester	21P/15,16;22A1,2	07 June	0	0	5	2.0	0.67	Yes	Yes
15	Cap Bateau	Gloucester	21P/15,16;22A1,2	07 June	0	0	?	0.1	0.33	No	Yes
16	Grand Lac (Lamèque)	Gloucester	21P/10	07 June	0	0	4	4.0	1.33	No	No
17	Chiasson Office	Gloucester	21P/10	07 June	0	0	5	3.0	0.83	No	Yes
18	École la Vague	Gloucester	21P/10	07 June	1	2	5	2.0	0.50	No	Yes
19	Baie-de-Petit-Pokemouche	Gloucester	21P/10	07 June	2	4	5	3.0	2.48	Yes	Yes
20	Grand Passage	Gloucester	21P/10	07 June	4	8	5	3.0	2.50	Yes	Yes
21	Plover Ground North	Gloucester	21P/10	07 June	0	1	4	7.0	4.65	Yes	Yes
22	Plover Ground South	Gloucester	21P/10	07 June	1	2	5	1.0	2.17	Yes	Yes
23	Green Point / Pointe Verte	Gloucester	21P/10	12 June	5	10	4	12.0	5.50	Yes	Yes
24	Tracadie Sandspit (Dune)	Gloucester	21P/10	13 June	11	22	4	12.0	5.00	Yes	Yes
25	Pointe-à-Bouveau	Gloucester	21P/10	09 June	4	8	4	6.0	4.25	Yes	Yes
26	Val Comeau	Gloucester	21P/7	09 June	1	2	1	3.0	2.50	Yes	Yes



## 2001 Piping Plover Census

Table 1. Results of 2001 International Piping Plover Breeding Census in New Brunswick (cont.)

Map #	Site	County	1:50,000 NTS Map Sheet	2001 census						91 census	96 census
				Date	No. of pairs	No. of adults	No. of observers	Distance surveyed (km)	No. of hours		
27	Pointe-à-Barreau	Northumberland	21P/7	08 June	1	2	5	3.0	2.00	Yes	Yes
28	Cedar Road South	Northumberland	21P/7	08 June	1	2	5	8.0	3.17	Yes	Yes
29	Cedar Road Spit	Northumberland	21P/7	11 June	4	8	4	5.0	3.00	Yes	Yes
30	Tabusintac Spit (Dune)	Northumberland	21P/7	09 June	8	17	5	10.0	5.58	Yes	Yes
31	Blacklands Sandspit (Crab Island, Swinging Point, Neguac North)	Northumberland	21P/7	10 June	4	8	4	4.0	2.00	No	Yes
32	Neguac Dune (Neguac Beach)	Northumberland	21P/7	14 June	6	12	6	10.0	3.50	Yes	Yes
33	Portage Island NWA	Northumberland	21P/3	07 June	3	7	4	19.0	1.00	Yes	Yes
34	Fox Island	Northumberland	21P/3	07 June	0	0	4	26.0	2.17	Yes	Yes
35	Egg Island	Northumberland	21P/3	07 June	0	0	4	1.0	0.08	Yes	No
36	Sheldrake Island	Northumberland	21P/3	07 June	0	0	1	1.5	0.33	Yes	Yes
37	Huckleberry Island	Northumberland	21P/3	07 June	0	0	2	2.3	0.50	Yes	Yes
38	Preston Beach	Northumberland	21P/2	12 June	0	0	2	2.3	0.67	Yes	Yes
39	Escuminac Beaches (includes Pointe de Pruches)	Kent	21P/2	12 June	1	2	2	11.5	2.67	No	Yes
40	Pointe-Sapin Beach	Kent	21I/15	12 June	0	0	1	3.0		No	Yes
41	Pointe-Sapin Dune *	Kent	21I/15	16 June	1	2	2	2.0	1.00	Yes	Yes
42	Portage-River Dune *	Kent	21I/15	15 June	4	8	1	2.7	2.00	Yes	Yes
43	North Kouchibouguac Dune*	Kent	21I/15	15 June	2	6	1	5.0	2.17	Yes	Yes
44	South Kouchibouguac Dune *	Kent	21I/15	08 June	1	3	1	7.0	2.00	Yes	Yes
45	North Richibucto Dune *	Kent	21I/15,10	14 June	0	0	1	7.4	1.50	Yes	Yes
46	South Richibucto Dune	Kent	21I/10	12 June	1	2	2	1.5	1.50	Yes	Yes

# 2001 Piping Plover Census

Table 1. Results of 2001 International Piping Plover Breeding Census in New Brunswick (cont.)

Site #	Site	County	1:50,000 NTS Map Sheet	Date	2001 census					91 census	96 census
					No. of pairs	No. of adults	No. of observers	Distance surveyed (km)	No. of hours		
47	South Richibucto Beach	Kent	211/10	07 June	0	0	3	7.6	3.75	Yes	Yes
48	Chockpish North	Kent	211/10	05 June	1	2	1	1.0	1.00	No	No
49	Chockpish Centre	Kent	211/10	06 June	0	0	0	2.0	1.17	No	No
50	South Chockpish Beach	Kent	211/10	06 June	0	0	1	0.9	1.00	No	No
51	Côte Sainte-Anne	Kent	211/10	07 June	0	0	0	5.2	2.42	No	No
52	Quai de St-Édouard	Kent	211/10	07 June	0	0	1	2.5	0.33	No	No
53	Dune de Bouctouche	Kent	211/10,7	13 June	5	11	2	12.5	4.00	Yes	Yes
54	Bar de Cocagne	Kent	211/7	11 June	0	0	1	1.2	0.37	Yes	Yes
55	Cocagne Island	Kent	211/7	13 June	0	0	2	12.0	3.00	No	No
56	Pointe Grande-Digue	Kent	211/7	11 June	0	0	0	1.4	0.83	Yes	Yes
57	Shediac Island	Westmorland	211/7	12 June	0	0	4	2.0	1.00	No	No
58	Cap Brûlé East	Westmorland	211/1	09 June	0	0	2	0.8	0.25	Yes	Yes
59	Cap Bimet West	Westmorland	211/1	09 June	0	0	2	1.2	0.67	Yes	Yes
60	Petit Barachois	Westmorland	211/1	09 June	0	0	2	0.8	0.75	Yes	Yes
61	Landry East	Westmorland	211/1	09 June	0	0	2	0.5	0.25	Yes	Yes
62	Little Cape	Westmorland	211/1	09 June	0	0	2	1.8	1.17	Yes	Yes
63	Johnston Point	Westmorland	211/1	08 June	0	0	2	1.6	1.17	Yes	Yes
64	Cadman Beach	Westmorland	211/1	08 June	0	0	2	1.5	1.67	Yes	Yes
65	Cape Jourimain NWA	Westmorland	111L/4	08 June	1	2	2	1.5	1.25	No	No
66	Waterside Beach	Albert	211/10	06 June	0	0	1	2.7	2.00	Yes	Yes
Totals					79	167	169	302.5	110.92		

\* Kouchibouguac National Park



## 2001 Piping Plover Census

Table 2. Changes in abundance of Piping Plovers in New Brunswick: comparison of results from the 1991, 1996 and 2001 International Censuses

Site	County	No. of pairs			No. of adults			Percent Change (pairs)			Percent Change (adults)		
		1991	1996	2001	1991	1996	2001	1991-1996	1991-2001	1996-2001	1991-1996	1991-2001	1996-2001
Waterside Beach	Albert	1	nc	0	2	nc	0	~	-100	~	~	-100	~
Long Pond Beach	Charlotte	0	nc	nc	0	nc	nc	~	~	~	~	~	~
Baie-de Petit Pokemouche	Gloucester	3	1	2	6	3	4	-66.7	-33.3	+100	-50	-33.3	+33
Beresford	Gloucester	nc	0	0	nc	0	0	~	~	0	~	~	0
Cap Bateau	Gloucester	nc	0	0	nc	0	0	~	~	0	~	~	0
Carron Point	Gloucester	0	0	0	0	0	0	0	0	0	0	0	0
Chiasson Office	Gloucester	nc	1	0	nc	2	0	~	~	-100	~	~	-100
École la Vague	Gloucester	nc	2	1	nc	4	2	~	~	-50	~	~	-50
Grand Passage	Gloucester	10	4	4	20	8	8	-60	-60	0	-60	-60	0
Grande Plaine (Ward Road N)	Gloucester	0	6	1	4	12	4	+	+	-83.3	+200	0	-66.7
Ile Pokesudie	Gloucester	nc	0	0	nc	0	0	~	~	0	~	~	0
Lac Frye	Gloucester	2	1	0	4	2	0	-50	-100	-100	-50	-100	-100
Maisonnette	Gloucester	0	0	nc	0	0	nc	0	~	~	0	~	~
Mark's Point	Gloucester	nc	nc	0	nc	nc	0	~	~	~	~	~	0
Middle Miscou Beach	Gloucester	nc	1	1	nc	2	2	~	~	0	~	~	0
Miscou Beach	Gloucester	1	1	0	3	2	0	0	-100	-100	-33	-100	-100
Miscou Centre Beach	Gloucester	0	nc	0	0	nc	0	~	0	~	~	0	~
Pigeon Hill Beach	Gloucester	2	1	0	5	3	0	-50	-100	-100	-40	-100	-100
Pigeon Hill Sandspit (Fox Den)	Gloucester	0	nc	1	0	nc	2	~	+	~	~	+	~
Plover Ground North	Gloucester	2	3	0	5	7	1	+50	-100	-100	+40	-80	-85.7
Plover Ground South	Gloucester	0	nc	1	0	nc	2	~	+	~	~	+	~
Pointe à Bouleau	Gloucester	6	6	4	13	14	8	0	-33.3	-33.3	+8	-38.5	-42.9
Pointe Verte	Gloucester	5	2	5	10	4	10	-60	0	+150	-60	0	+150
Ruisseau Chenière	Gloucester	0	0	1	0	0	2	0	+	+	0	+	+
Tracadie Dune	Gloucester	6	5	11	12	12	22	-16.7	+83	+120	0	+83	+83
Val Comeau	Gloucester	1	1	1	2	2	2	0	0	0	0	0	0
Wilson Point	Gloucester	1	1	2	3	2	4	0	+100	+100	-33	+33	+100
Wilson Point S (Sandy Point)	Gloucester	1	1	0	3	2	0	0	-100	-100	-33	-100	-100

Table 2. Changes in abundance of Piping Plovers in New Brunswick: comparison of results from the 1991, 1996 and 2001 International Censuses (cont.)

Site	County	No. of pairs			No. of adults			Percent Change (pairs)			Percent Change (adults)		
		1991	1996	2001	1991	1996	2001	1991-1996	1991-2001	1996-2001	1991-1996	1991-2001	1996-2001
Bar de Cocagne	Kent	0	0	0	0	0	0	0	0	0	0	0	0
Chockpish Centre	Kent	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Chockpish Nord	Kent	nc	nc	1	nc	nc	2	~	~	~	~	~	~
Côte-Sainte-Anne	Kent	nc	nc	0	nc	nc	0	~	~	~	~	~	~
Dune de Bouctouche	Kent	7	2	5	14	5	11	-71.4	-28.6	+150	-64.3	-21.4	+120
Escuminac Beaches	Kent	nc	2	1	nc	4	2	~	~	-50	~	~	-50
North Kouchibouguac Dune *	Kent	4	4	2	8	9	6	0	-50	-50	+13	-25	-33.3
Pointe Grande-Digue	Kent	0	0	0	0	0	0	0	0	0	0	0	0
Pointe-Sapin Beach	Kent	0	1	0	0	2	0	+	0	-100	+	0	-100
Point-Sapin Dune *	Kent	1	1	1	2	2	2	0	0	0	0	0	0
Portage River Dune *	Kent	3	1	4	6	3	8	-66.7	+33	+300	-50	+33	+167
Quai de St.-Édouard	Kent	nc	nc	0	nc	nc	0	~	~	~	~	~	~
South Chockpish Beach	Kent	nc	nc	0	nc	nc	0	~	~	~	~	~	~
South Kouchibouguac Dune *	Kent	6	4	1	12	8	3	-33.3	-83.3	-75	-33.3	-75	-62.5
South Richibucto Beach	Kent	1	nc	0	2	nc	0	~	-100	~	~	-100	~
South Richibucto Dune	Kent	1	0	1	2	0	2	-100	0	+	-100	0	+
Tern Islands *	Kent	1	nc	nc	2	nc	nc	~	~	~	~	~	~
Blacklands Spit	Northumberland	nc	0	4	nc	2	8	~	~	+	~	~	+300
Cedar Road Beach South	Northumberland	8	3	1	16	7	2	-62.5	-87.5	-66.7	-56.3	-87.5	-71.4
Cedar Road Spit	Northumberland	0	nc	4	0	nc	8	~	+	~	~	+	~
Egg Island	Northumberland	0	nc	0	0	nc	0	~	0	~	~	0	~
Fox Island	Northumberland	0	0	0	0	0	0	0	0	0	0	0	0
Huckleberry Island	Northumberland	0	0	0	0	0	0	0	0	0	0	0	0
Neguac	Northumberland	8	3	6	19	6	12	-62.5	-25	+100	-68.4	-36.8	+100
Pointe à Barreau	Northumberland	0	1	1	0	2	2	+	+	0	+	+	0
Portage Island NWA	Northumberland	1	1	3	2	3	7	0	+200	+200	+50	+250	+133
Preston Beach	Northumberland	0	0	0	1	0	0	0	0	0	-100	-100	0
Sheldrake Island	Northumberland	0	0	0	0	0	0	0	0	0	0	0	0
Tabusintac Spit	Northumberland	7	5	8	21	12	17	-28.6	+14	+60	-42.9	-19	+48

# 2001 Piping Plover Census

Table 2. Changes in abundance of Piping Plovers in New Brunswick: comparison of results from the 1991, 1996 and 2001 International Censuses (cont.)

Site	County	No. of pairs			No. of adults			Percent Change (pairs)			Percent Change (adults)		
		1991	1996	2001	1991	1996	2001	1991-1996	1991-2001	1996-2001	1991-1996	1991-2001	1996-2001
Cadman Beach	Westmorland	0	0	0	0	0	0	0	0	0	0	0	0
Cap Bimet West	Westmorland	0	0	0	0	0	0	0	0	0	0	0	0
Cap Brûlé East	Westmorland	0	0	0	0	0	0	0	0	0	0	0	0
Cape Jourimain NWA	Westmorland	nc	nc	1	nc	nc	2	~	~	~	~	~	~
Johnston Point	Westmorland	0	nc	0	0	nc	0	~	0	~	~	0	~
Landry East	Westmorland	0	0	0	0	0	0	0	0	0	0	0	0
Little Cape	Westmorland	1	0	0	2	0	0	-100	-100	0	0	-100	0
Petit Barachois	Westmorland	1	0	0	2	0	0	-100	-100	0	-100	-100	0
Total		4032	4057	4081	4185	4138	4169	-28.6	-13.2	+22	-28.1	-17.7	+14

\*Kouchibouguac National Park

nc - no census

## 2001 Piping Plover Census

Table 3. Fledging success and productivity (number of chicks fledged/pair) in New Brunswick, 2001.

Site	County	No. of pairs monitored	Nesting attempts	Successful nests	No. fledged	Productivity
Ruisseau Chenière, Miscou Island	Gloucester	1	1	1	3	3
Miscou Beach	Gloucester	1	1	1	3	3
Wilson Point North, Miscou Island	Gloucester	2	2	2	7	3.5
Grande Plaine, Miscou Island	Gloucester	2	1	1	2	1
École la Vague	Gloucester	1	1	1	2	2
Baie de Petit-Pokemouche	Gloucester	2	2	2	6	3
Grand Passage	Gloucester	4	4		6	1.5
Plover Ground South	Gloucester	1	2	0	0	0
Pointe Verte	Gloucester	5	5		1	0.2
Tracadie Sandspit (Dune)	Gloucester	11	?		5	0.45
Pointe à Bouleau	Gloucester	4	4		7	1.75
Val Comeau	Gloucester	1	1	0	0	0
Lac Frye, Miscou Island	Gloucester	1	1	0	0	0
Middle Miscou	Gloucester	1	1	1	3	3
Escuminac	Kent	1	1	1	3	3
Chockpish	Kent	1	1	1	3	3
Bouctouche Bar	Kent	5	6	5	13	2.6
Pointe Sapin Dune, KouchNP	Kent	1	1	1	2	2
Portage River Dune, KouchNP	Kent	4	4		11	2.75
North Kouchibouguac Dune, KouchNP	Kent	2	3	2	4	2
South Kouchibouguac Dune, KouchNP	Kent	2	3	2	3	1.5
South Richibucto Dune	Kent	1	1	1		
Pointe à Barreau	Northumberland	2	2	1	3	1.5
Tabusintac Sandspits	Northumberland	9	9		20	2.22
Neguac Sandspit	Northumberland	6	6		9	1.5
Portage Island National Wildlife Area	Northumberland	2	2		6	3
Cedar Road South	Northumberland	1	1	1	4	4
Cedar Road Spit	Northumberland	4	4		7	1.75
Neguac Spit North	Northumberland	2	2		1	0.5
Cape Jourimain National Wildlife Area	Westmorland	1	1	0	0	0
Total		81	73		134	1.85

## Recensement international du Pluvier siffleur au Québec, en 2001

François Shaffer

*Service canadien de la faune, Direction de la conservation de l'environnement*

*Région du Québec, 1141 Route de l'Église, C.P. 10100, Sainte-Foy, (Québec) Canada G1V 4H5*

*Courriel: francois.shaffer@ec.gc.ca*

### Résumé

Dans le cadre du troisième Recensement international du Pluvier siffleur (*Charadrius melodus melodus*), les plages de la Côte-Nord, de la Gaspésie et des Îles-de-la-Madeleine ont été visitées afin d'y dénombrer cette espèce. Plus de 223,8 km de plages ont été recensés, soit 67,8 km sur la Côte-Nord, 28,3 km en Gaspésie et 127,7 km aux Îles-de-la-Madeleine. Tout comme lors des inventaires précédents, l'espèce est absente de la Côte-Nord et de la Gaspésie. Aux Îles-de-la-Madeleine, 35 couples se sont reproduits au cours de l'été 2001. Il s'agit d'une baisse de la population par rapport aux résultats des inventaires réalisés en 1991 et 1996.

### Abstract

As part of the third International Piping Plover Census, beaches on the North Shore, the Gaspé Peninsula, and the Magdalen Islands were surveyed for (*Charadrius melodus melodus*). The linear distance of beaches surveyed was 68 km on the North Shore, 28 km in the Gaspé and 128 km on the Magdalen Islands for a total of 223 km. As during previous censuses, there were no sightings on the North Shore or Gaspé area. In the Magdalen Islands, there were 35 breeding pairs in the summer of 2001, lower than at the time of the 1991 and 1996 censuses.

### Introduction

Au Québec, à l'été 2001, dans le cadre du troisième Recensement international du Pluvier siffleur (*Charadrius melodus melodus*), les plages des Îles-de-la-Madeleine, de la Gaspésie et de la Côte-Nord ont été visitées dans le but d'y dénombrer les oiseaux. Des recensements similaires ont eu lieu en 1991 et 1996 (Haig et Plissner 1993; Plissner et Haig 1997). Effectués selon une méthodologie similaire à l'ensemble de l'Amérique du Nord, ces inventaires permettent d'établir des comparaisons entre les résultats des différentes régions. Ils permettent aussi de déterminer la tendance des effectifs de cette espèce d'oiseaux désignée en danger de disparition au Canada (COSEPAC 2001).

En plus des inventaires de 1991 et de 1996, les plages des régions de la Côte-Nord et de la Gaspésie avaient été également visitées en 1988 (Demers et Laporte 1988). Pour ce qui est des plages des Îles-de-la-Madeleine, elles font l'objet d'un suivi annuel depuis la fin des années 1980 (Laporte et Shaffer 1994 ; Shaffer et Laporte 1995a ; SCF données inédites). Cet archipel est le seul site de nidification de l'espèce récemment utilisé dans la province de Québec. Des mesures de protection sont mises en place annuellement pour favoriser le succès de reproduction du Pluvier siffleur. Ces mesures visent notamment à réduire le dérangement humain à proximité des nids et à limiter la prédation.

Le présent document fournit les résultats du Recensement international du Pluvier siffleur de 2001 pour le territoire québécois. De plus, il les compare aux résultats obtenues lors des inventaires précédents.

## Méthode

La méthodologie d'inventaire suivie en 2001 est sensiblement la même que celle des inventaires de 1991 et de 1996 (Laporte et Shaffer 1994 ; Laporte et Shaffer 2004). Toutefois, alors qu'en 1996, une équipe de deux personnes recensait chaque plage en Gaspésie et sur la Côte-Nord, cette fois-ci, les plages ont été parcourues par un seul observateur. Pour la Côte-Nord, l'inventaire s'est déroulé du 8 au 16 juin. Contrairement aux inventaires précédents, les plages de Pashashibou, de la baie de Sept-Îles et celle de Sept-Îles n'ont pas été inventoriées. En Gaspésie, l'inventaire s'est échelonné du 7 au 12 juin et, tout comme en 1991 et en 1996, les mêmes plages ont été visitées.

Aux Îles-de-la-Madeleine, un inventaire organisé par Attention Fragiles, un organisme à but non lucratif voué à la protection de l'environnement, s'est déroulé le 9 juin. Au cours de cette journée, 39 participants ont parcouru la totalité des plages de l'archipel, à l'exception de celles de l'île Brion, de l'îlot B et l'île du Chenal (îlot C). Ces deux derniers endroits sont désormais jugés non propices à la nidification du Pluvier siffleur. Quant à l'île Brion, elle n'a été visitée que le 21 juin en raison de difficultés logistiques pour y accéder.

En plus des informations obtenues lors de la journée du 9 juin 2001, les données recueillies par l'équipe formée par le personnel d'Attention Fragiles et du Service canadien de la faune ont aussi servi à compléter les résultats. Cette équipe, chargée de mettre en place les mesures de protection des nids et des oisillons du Pluvier siffleur, collige également les données relatives à sa nidification. Un suivi hebdomadaire des nids et des oisillons est effectué.

## Résultats

Au Québec, à l'été 2001, 70 Pluviers siffleurs ont été dénombrés lors de l'inventaire, lequel a couvert 223,8 km de plages réparties en 40 sites (tableau 1). Le nombre de kilomètres parcourus est inférieur de 5% à celui de 1996. Ceci s'explique par le fait que certaines plages, maintenant jugées non propices pour le Pluvier siffleur n'ont pas été visitées.

Sur la Côte-Nord, plus de 67 km de plages, répartis en 14 sites, ont été inventoriés. Avec les inventaires de 1988, 1991 et 1996, il s'agit du quatrième inventaire consécutif, sans qu'aucun Pluvier siffleur n'y soit vu (tableau 1). En Gaspésie, la situation est similaire. Il y a eu 10 plages de visitées, totalisant plus de 28 km, sans que l'espèce soit observée. Le Pluvier siffleur était aussi absent lors des inventaires de 1988, 1991 et 1996 (tableau 1).

Lors des trois Recensements internationaux du Pluvier siffleur, le nombre d'oiseaux a été obtenu de deux façons aux Îles-de-la-Madeleine, soit en effectuant d'une part un dénombrement en une seule journée à l'aide de plusieurs participants et, d'autre part, en faisant un suivi régulier des oiseaux nicheurs tout au cours de la saison de nidification dans le cadre des travaux de protection des nids et des oisillons. L'ensemble des plages parcourues sur l'archipel madelinot représente 127,7 km (tableau 1). Lors de la journée du 9 juin, il y a eu 55 oiseaux de recensés. Toutefois, en considérant les oiseaux dénombrés lors de la journée du 9 juin et l'ensemble des autres observations colligées durant les semaines qui ont précédé ou suivi cette journée, c'est un total de 35 couples qui se sont reproduits aux Îles-de-la-Madeleine en 2001. Les plages abritant le plus grand nombre de Pluviers siffleurs sont celles de la Dune du Sud et de l'Hôpital. Ces sites totalisent chacun 22,8% de la population.

Le tableau 2 permet une comparaison entre les résultats obtenus à chacune des années aux Îles-de-la-Madeleine. Ainsi, les inventaires réalisés au cours d'une même journée fournissent des résultats qui s'avèrent toujours inférieurs aux décomptes des couples nicheurs se déroulant sur l'ensemble de la saison de nidification. En fait, ils permettent de localiser en moyenne 81% des oiseaux dénombrés au cours de la saison de nidification.

## Discussion

Les Îles-de-la-Madeleine constituent depuis plus de 15 ans le dernier retranchement du Pluvier siffleur au Québec. L'inventaire de 2001 confirme à nouveau ce fait. En effet, en Gaspésie, aucun oiseau n'a été signalé depuis le début des années 1970, alors que sur la Côte-Nord, la dernière évidence de nidification a été notée en 1986 (Shaffer et Laporte 1995a; Shaffer et Laporte 1995b).

La Gaspésie est située à quelques dizaines de kilomètres de la Péninsule acadienne (Nouveau-Brunswick), où plusieurs couples de Pluviers siffleurs se reproduisent annuellement (Chiasson *et al.* 1994). La courte distance séparant ces deux régions suggère que le Pluvier siffleur pourrait éventuellement coloniser à nouveau les plages de la Gaspésie. Toutefois, son absence depuis près de 30 ans laisse supposer que les plages de la Gaspésie n'offrent peut-être pas un habitat d'une qualité suffisante pour permettre leur utilisation par cette espèce.

Sur la Côte-Nord, il existe plusieurs plages, dont certaines s'avèrent à première vue encore potentielles pour le Pluvier siffleur. Toutefois, cette région étant plus éloignée des autres zones de nidification du Pluvier siffleur, les probabilités que cette région reçoive à nouveau la visite de cet oiseau s'avèrent plus faibles.

La présence de 35 couples de Pluviers siffleurs en 2001 aux Îles-de-la-Madeleine représente une baisse par rapport aux résultats des deux Recensements internationaux précédents, soit ceux de 1991 et de 1996. La baisse est respectivement de l'ordre de 7,9 % et de 32,7%. Toutefois, les données des inventaires réalisés annuellement aux Îles-de-la-Madeleine de 1987 à 1995 indiquent clairement qu'au cours de cette période la population a cependant augmenté régulièrement (Shaffer et Laporte 1995a). Elle a atteint un maximum de 53 couples en 1995. Cette hausse a été attribuée à la mise en place, dès le début des années 1990, de mesures de protection qui ont pratiquement éliminé la destruction des nids par l'écrasement des œufs par des véhicules motorisés. Depuis le milieu des années 1990, les effectifs de la population ont néanmoins diminué de façon irrégulière. Le nombre de couples a été de 52, 45, 36, 44 et 36 de 1996 à 2000 respectivement (Roy 1996; Roy 1998a; Roy 1998b; Roy et Soumagnas 2000; Soumagnas 2001). En 2001, la population a atteint le même niveau qu'au début des années 1990, soit 35 couples et ce, même si les mesures de protection sont mises en place à chaque année. De plus, les « exclos » visant à prévenir la prédation ont été largement employés, particulièrement depuis 1997. Des problèmes de prédation, de dérangements humains et de mauvaises conditions météorologiques sont probablement les principales causes expliquant ces fluctuations à la baisse de la population. Pour protéger les nids et les œufs, les périmètres de protection et les « exclos » s'avèrent relativement efficaces. Le principal problème est d'assurer la protection des oisillons qui se déplacent librement sur la plage. Comme il est difficile de les contenir dans un secteur sans dérangement humain, les oisillons s'exposent alors à des dérangements répétitifs. Les facteurs limitatifs opérant sur les aires d'hivernage et lors des migrations expliquent sans doute, eux aussi, une partie de ces fluctuations.

## Remerciements

Je désire remercier Pierre Laporte et Yann Rochepault qui ont respectivement parcouru les plages de la Gaspésie et celles de la Côte-Nord. Mes remerciements vont également à l'équipe d'Attention Fragiles, plus particulièrement à Danielle Giroux, Bernise Leblanc, Carole Leblanc, Pascal Poirier et Alain Richard pour l'organisation de la journée d'inventaire aux Îles-de-la-Madeleine. Je tiens aussi à remercier tous les bénévoles qui ont participé à ce recensement : Chantal Bénard, Isabelle Boivin, Benoit Boudreau, Myriam Bourque, Roger Charron, Tammy Clarke, Gérard Cyr, Huquette Cyr, Sébastien Cyr, Isabelle Daigneault, Lucie d'Amours, Dany Déraspe, Raymond Gauthier, Catherine Giroul, Lucienne Harvie, Claudine Hubert, Isabelle Hubert, Daisy Kidston, Noémie Landry, Séverine Palluel, Lionel Picard, Céline Poirier, Jean-Claude Richard, Line Richard, Mélanie Richard, Noël Richard, Claude Roy, Damien Turbide, Louise Turbide, Sophie Turbide et Rita Vigneau.

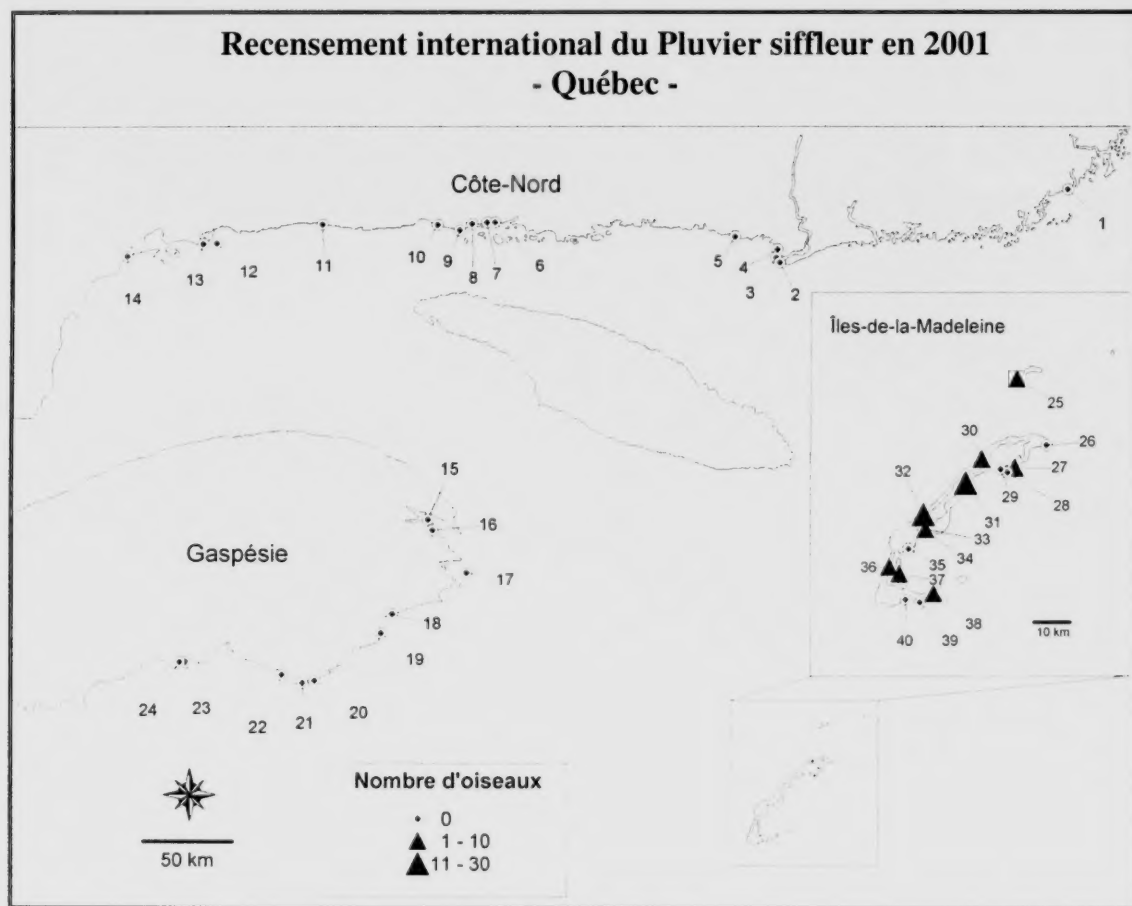


Figure 1. La distribution du Pluvier siffleur au Québec pendant le recensement de 2001.



Tableau 1. Résultats du Recensement international du Pluvier siffleur au Québec en 2001.

Inventaire 2001								Inventorié en 1991	Inventorié en 1996
Carte	Site	Région	Inventaire d'un jour		Inventaire estival		Distance parcourue (km)		
			Date	Nombre d'individus	Nombre de couples	Nombre d'individus			
5	Aguanish	Côte-Nord	14 juin	0	0	0	12,0	oui	oui
8	Baie de Mingan	Côte-Nord	9 juin	0	0	0	9,0	oui	oui
1	Chevery	Côte-Nord	15 juin	0	0	0	3,0	oui	oui
3	Île Sainte-Hélène	Côte-Nord	16 juin	0	0	0	2,0	oui	oui
9	Longue Pointe	Côte-Nord	10 juin	0	0	0	6,5	oui	oui
12	Matamec	Côte-Nord	11 juin	0	0	0	7,5	oui	oui
13	Moisie	Côte-Nord	11 juin	0	0	0	2,5	oui	oui
4	Natashquan	Côte-Nord	15 juin	0	0	0	5,5	oui	oui
6	Pointe du Curé	Côte-Nord	10 juin	0	0	0	2,8	oui	oui
2	Pointe du Vieux Poste	Côte-Nord	16 juin	0	0	0	4,0	oui	oui
7	Pointe Matarteux	Côte-Nord	10 juin	0	0	0	1,5	oui	oui
11	Rivière aux Graines	Côte-Nord	8 juin	0	0	0	1,5	oui	oui
14	Rivière Brochu (plage est)	Côte-Nord	12 juin	0	0	0	6,7	oui	oui
10	Rivière Saint-Jean	Côte-Nord	10 juin	0	0	0	3,3	oui	oui
19	Anse aux Îlots	Gaspésie	12 juin	0	0	0	0,8	oui	oui
15	Barre de Sandy Beach	Gaspésie	11 juin	0	0	0	3,4	oui	oui
22	Bonaventure	Gaspésie	12 juin	0	0	0	3,2	oui	oui
17	Coin-du-Banc	Gaspésie	7 juin	0	0	0	7,3	oui	oui
16	Haldimand	Gaspésie	11 juin	0	0	0	3,2	oui	oui

## 2001 Piping Plover Census

Tableau 1. Résultats du Recensement international du Pluvier siffleur au Québec en 2001 (cont.)

Inventaire 2001								Inventorié en 1991	Inventorié en 1996
Carte	Site	Région	Inventaire d'un jour		Inventaire estival		Distance parcourue (km)		
			Date	Nombre d'individus	Nombre de couples	Nombre d'individus			
24	Île-Groscilles-Saint-Omer	Gaspésie	7 juin	0	0	0	0,8	oui	oui
23	Île-Laviolette-Saint-Omer	Gaspésie	7 juin	0	0	0	1,4	oui	oui
21	New-Carlisle	Gaspésie	7 juin	0	0	0	2,7	oui	oui
20	Paspébiac	Gaspésie	12 juin	0	0	0	2,8	oui	oui
18	Plage du Grand Pabos	Gaspésie	12 juin	0	0	0	2,7	oui	oui
27	Bassin aux Huîtres est	Îles-de-la-Madeleine	9 juin	8	4	8	1,7	oui	oui
28	Bassin aux Huîtres ouest	Îles-de-la-Madeleine	9 juin	0	0	0	0,6	oui	oui
40	Dune du Bassin	Îles-de-la-Madeleine	9 juin	0	0	0	3,2	oui	oui
30	Dune du Nord	Îles-de-la-Madeleine	9 juin	4	3	6	16,4	oui	oui
31	Dune du Sud	Îles-de-la-Madeleine	9 juin	11	8	16	19,9	oui	oui
25	Île Brion	Îles-de-la-Madeleine	21 juin		1	2	3,5	oui	oui
34	La Digue	Îles-de-la-Madeleine	9 juin	0	0	0	2,1	oui	oui
33	La Pointe	Îles-de-la-Madeleine	9 juin	2	1	2	1,5	oui	oui
32	Plage de l'Hôpital	Îles-de-la-Madeleine	9 juin	17	8	16	17,5	oui	oui
36	Plage de l'Ouest	Îles-de-la-Madeleine	9 juin	4	3	6	11,0	oui	oui
39	Plage du Havre	Îles-de-la-Madeleine	9 juin	0	0	0	4,4	oui	oui
37	Plage Martinique-Havre-Aubert	Îles-de-la-Madeleine	9 juin	5	4	8	12,0	oui	oui

Tableau 1. Résultats du Recensement international du Pluvier siffleur au Québec en 2001 (cont.)

Inventaire 2001								Inventorié en 1991	Inventorié en 1996
Carte	Site	Région	Inventaire d'un jour		Inventaire estival		Distance parcourue (km)		
			Date	Nombre d'individus	Nombre de couples	Nombre d'individus			
29	Pointe de la Grande-Entrée	Îles-de-la-Madeleine	9 juin	0	0	0	0,8	oui	oui
26	Pointe de l'Est	Îles-de-la-Madeleine	9 juin	0	0	0	19,5	oui	oui
35	Procul-Bourgeois	Îles-de-la-Madeleine	9 juin	0	0	0	0,8	non	oui
38	Sandy Hook	Îles-de-la-Madeleine	9 juin	4	3	6	12,2	oui	oui
			Total	55	35	70	223,8		

Tableau 2. Nombre de Pluviers siffleurs recensés en 1991, 1996 et 2001 selon les résultats obtenus au cours d'une seule journée d'inventaire en comparaison des résultats tenant compte de l'ensemble de la période de nidification.

	1991	1996	2001
Données obtenues en une seule journée d'inventaire	61	87	55
Données issues de l'ensemble de la période de nidification	76	104	70
Pourcentage (%)	80,3	83,7	78,6

## The 2001 Piping Plover census in Ontario

Leo E. Heyens

Ontario Ministry of Natural Resources, P.O. Box 5080, Kenora, Ontario, P9N 3X9

### Abstract

Former and existing breeding locations of the Piping Plover (*Charadrius melodus circumcinctus*) in Ontario were censused as part of the 2001 International Piping Plover Census. A total of 37 locations were surveyed in Ontario with two adult Piping Plovers being reported. One adult bird was observed on 10 June at Windy Point, Lake of the Woods and another adult bird was observed on 24 May, and again on 5, 7, 10 June at Long Point, Lake Erie. During the 1996 International Piping Plover Census, four adult birds were observed in Ontario (Heyens 1996). Adult Piping Plovers continue to be observed in the Ontario portion of Lake of the Woods (Windy Point and/or the Sable Islands). This suggests that a small remnant population of Piping Plovers may occasionally breed in this area. Conservation measures include the use of nest exclosures on all nests and signage of nesting habitat to prevent human disturbance during the nesting period.

### Résumé

En Ontario, les aires de nidification antérieures et actuelles du Pluvier siffleur (*Charadrius melodus circumcinctus*) ont été surveillées dans le cadre du recensement international de 2001. Les recenseurs ont surveillé 37 plages en tout et y ont observé deux adultes. L'un d'eux a été repéré le 10 juin à la pointe Windy, sur les bords du lac des Bois, et l'autre, le 24 mai et à nouveau les 5, 7 et 10 juin à la pointe Long, sur les bords du lac Érié. Pendant le recensement international de 1996, quatre adultes avaient été dénombrés en Ontario (Heyens 1996). Une petite population relique continue de nicher dans la partie ontarienne du lac des Bois (à la pointe Windy ou aux îles Sable). Les mesures de conservation comprennent l'aménagement d'exclos autour de tous les nids et la pose de panneaux dans les aires de nidification pour prévenir toute perturbation humaine pendant la période de nidification.

### Introduction

An intensive survey of former breeding locations of the Piping Plover (*Charadrius melodus circumcinctus*) in Ontario was conducted during 2001 as part of the International Piping Plover Census. Former and potential breeding locations along the Great Lakes shorelines (Lakes Superior, Huron, Erie, Ontario) and Lake of the Woods, Ontario, were surveyed as part of this census. This paper describes the 2001 census results in comparison to the 1996 and 1991 censuses and where possible, relates these results to historical numbers and distribution of the Piping Plover in Ontario. Lastly, a brief discussion is included which summarizes the status of the Piping Plover in Ontario and conservation measures to protect this endangered species.

### Methods

A total of 37 locations within Ontario were censused during 2001 (33 sites on the Ontario Great Lakes and 4 sites on Lake of the Woods - Table 1) compared to seventeen during the 1996 survey and three during the 1991 survey. All of these locations were surveyed on foot with some locations requiring the use of a boat to access offshore islands.

Two known Piping Plover nesting sites on the Ontario portion of Lake of the Woods were censused during the survey period. Windy Point and the Sable Islands Provincial Nature Reserve were surveyed on 10 and 11 June respectively. These sites were accessed by boat from Kenora, Ontario. The entire length of Sable Islands (6 km) was walked, and approximately 0.5 km of suitable habitat at the tip of Windy Point was covered on foot during the survey.

A number of potential Piping Plover nesting sites consisting of large sand beaches on the south side of Big Island (Oshie Bay) and Bigsby Island (Deep Bay) on Lake of the Woods were also surveyed during 2001. On Lake Superior and Lake Huron, 3 and 23 sites were surveyed respectively. On Lake Erie, 7 high potential nesting sites, including known historic nesting locations, were also surveyed.

## Results

All sites were surveyed during stable weather conditions. Water levels on Lake of the Woods were however abnormally high, setting a 50-year record high during the nesting period (elevation 323.59 m. ASL on 10 June and peaked at elevation 323.67 m. ASL on 28 June). Beach areas were non-existent or significantly reduced during 2001 resulting in little suitable nesting habitat for Piping Plovers on Lake of the Woods. Meanwhile, water levels on the Ontario Great Lakes were well below normal during 2001 resulting in greater availability of potential nesting habitat.

Piping Plovers were located at two of the 37 sites censused (Table 1). One adult Piping Plover was observed on Windy Point defending a recently wave-washed nest scrape on 10 June. Given that water levels on Lake of the Woods set a record for high water during 2001 and that levels peaked on 28 June, no further survey attempts were made. One adult Piping Plover was observed at Long Point, Lake Erie on 24 May, and on 5, 7, and 10 June. Based on the band combination observed, this individual was believed to be a bird banded as a chick at the mouth of the Platte River in Sleeping Dunes National Lakeshore, Michigan (Lake Michigan). This bird had a noticeable limp and it appeared that a band had slipped down the leg and was restricting toe movement.

Piping Plovers were not observed at any of the other surveyed sites during 2001. Two adult Piping Plovers were observed at Presqu'île Provincial Park, on Lake Ontario during 2001. One individual was observed on 11 May and a second banded bird was observed there on 2 June. This bird was thought to be a female originally banded at Grand Marais, Michigan (Lake Superior) in 1998 and had not been seen since. Lastly, an unbanded adult Piping Plover was observed on 30 April at the Mission Island Marsh in Thunder Bay (Lake Superior). There was no suitable Piping Plover nesting habitat on the Sable Islands and only a small marginal area at Windy Point.

## Discussion

A small population of Piping Plovers apparently continues to breed at Lake of the Woods. However, record high water on the lake during the 2001 International Census prevented breeding during this particular year. Normal lake levels result in extensive habitat for the Piping Plover on the lake during most years. Despite the extensive efforts to census 33 locations that were either former breeding locations or are known to have high breeding potential, breeding evidence was not documented for the Piping Plover on the Ontario Great Lakes. It is however, encouraging for Ontario to report four individual sightings of Piping Plovers from the Great Lakes and Ontario remains optimistic that a breeding pair will establish itself at one of the former breeding sites.

The Piping Plover was once widespread throughout the Great Lakes Region with numbers estimated to be approximately 150 breeding pairs (Cadman *et al.* 1987). Significant population declines occurred during the 1960's and 70's with the last known breeding in southern Ontario occurring in 1977 at Long Point Beach on Lake Erie (Lambert and Nol 1978). Piping Plovers continue to be seen at Long Point beach on an annual basis, and during the last few years, these individual birds have remained at this site during the breeding season for a number of days.

A variety of explanations have been put forward to explain the population decline. It would appear that one of the primary reasons is the increasing use of beach habitat for recreational purposes. The destruction of nests and young by pedestrian and vehicular traffic and the disturbance of nesting birds by recreationists are the main concerns. Increasing numbers of natural predators such as raccoons, foxes, gulls, and crows have been apparent in these regions and have been known to contribute to population declines across the species range (Cairns and McLaren 1980).

A small population of Piping Plovers continues to breed in the extreme north-west portion of the province on Lake of the Woods. This population consists of an Ontario and Minnesota segment. The Minnesota population breeds primarily on two off-shore barrier sand islands (Pine and Curry Islands). This group has continued to decline from a high of approximately 50 adults during the early 1980's to 11 adults in 2000 (Maxson *et al.* 1996; MDNR 2000).

In recent years, the Ontario population has been restricted to the Sable Islands Provincial Nature Reserve and to Windy Point (Figure 1). The number of adult Piping Plovers observed on the Sable Islands remained relatively constant until 1992 when no Piping Plovers were observed (Table 2). Piping Plovers have not been observed breeding on the Sable Islands since 1992. Prior to 1995, Piping Plovers would occasionally be observed on Windy Point, although nesting success was very poor. It would appear that predation by Red Fox (*Vulpes fulva*) and Ring-billed Gull (*Larus delawarensis*) were the primary factors contributing to unsuccessful nesting attempts at this site. The very tip of Windy Point was breached by a late 1994 fall storm and has resulted in a small island being formed at the tip of the point. Since this event, at least one pair of Piping Plovers has successfully nested on Windy Point. This small offshore island now presents a barrier to mammalian predators and coupled with the use of nest exclosures, nests are not being depredated prior to hatching.

It does not appear that the availability of suitable habitat on Windy Point or on the remainder of Lake of the Woods is a limiting factor on the viability of this population. An investigation of 19 sites by Lambert and Risley (1989), found that six of these sites were categorized as fair or good habitat, while the remaining sites were categorized as marginal or unsuitable habitat.

Extensive habitat is available at the Sable Islands. The major threats to this population are from recreationists and fluctuating water levels on Lake of the Woods. Both of these impacts are manageable and attempts have been made by the Ontario Ministry of Natural Resources to educate recreationists regarding the protection of Piping Plovers and their habitat requirements. Signage is in place at three separate locations on the Sable Islands advising recreationists of the protected status of the islands and that the use of all-terrain vehicles is prohibited. The Lake of the Woods Water Control Board is the agency responsible for controlling water levels on the lake and has been made aware of the habitat requirements of this endangered species.

In conclusion, a small remnant "population" of Piping Plovers continues to breed in north-western Ontario at Lake of the Woods. While the 2001 International Census did not document any breeding evidence, one adult Piping Plover was observed at Windy Point defending territory. The 1991 and 1996 International Census documented five birds and three birds at this location, respectively. During the periods of 1986-1988 and 1990-2001 Piping Plovers were occasionally reported from other parts of Ontario (Heyens unpubl. data). However, these birds appear to be transients and do not breed at these locations. Preliminary results from genetic analysis of recovered Piping Plover remains indicate that the Ontario Great Lakes population is part of the Northern Great Plains population and not a separate population as previously thought (Haig and Elliott-Smith 2004). Annual censuses will continue to be carried out on the Lake of the Woods population and nest exclosures and endangered species signage will continue to be used at or near any nest sites.

### Acknowledgements

I wish to thank Ontario's Living Legacy - Species at Risk program for providing funding to conduct the 2001 International Piping Plover Census in Ontario. A special thanks to Scott Jones (Ontario Ministry of Natural Resources) for his efforts to coordinate the Ontario Great Lakes census effort and gather together the many census forms for each site. I would also like to thank David Anderson (Ontario Ministry of Natural Resources) for his continued support and assistance during the annual census of the Ontario Lake of the Woods sites.

Finally, I would like to thank the Beyak family for their continued support of the Piping Plover Program and kind permission for allowing the census to be conducted on their property at Windy Point, Lake of the Woods.



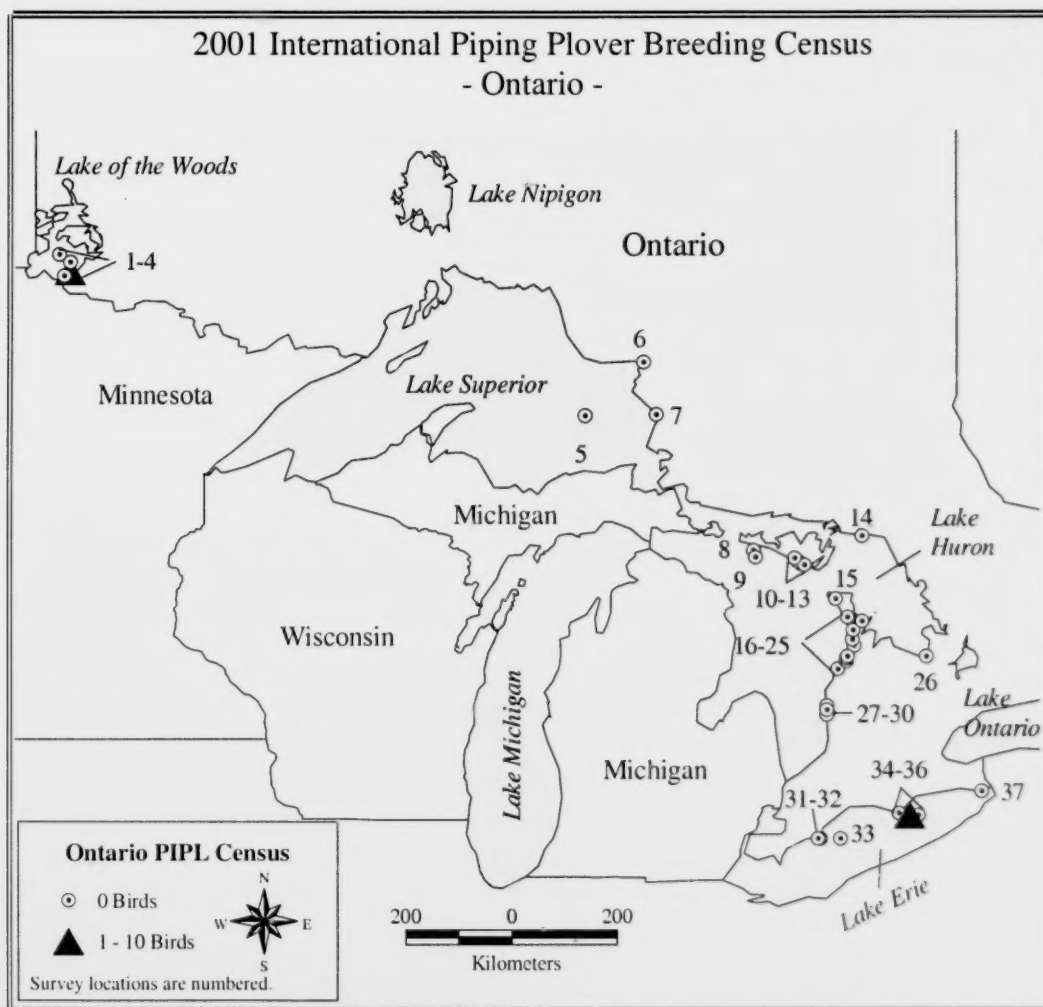


Figure 1: Distribution of Piping Plover in Ontario during 2001 census.

Table 1. Results of International Piping Plover Breeding Census in Ontario, 1991, 1996 &amp; 2001

Map #	Site	Lake	1:50,000 NTS Map Sheet	Date	2001 census			91 census (adults)	96 census (adults)
					No. pairs	No. adults	Distance surveyed (km)		
34	Hahn Woods Hastings Drive	Lake Erie	40I/10	12-Jun	0	0	5.7	No	No
35	Long Point	Lake Erie	40I/9	7-Jun	0	1	7.5	0	0
36	Long Pt. Courtright Ridge	Lake Erie	40I/9	20-Jun	0	0	20	0	0
37	Port Albino (west side)	Lake Erie	30I/14	13-Jun	0	0	1.5	No	No
32	Rondeau P. P. SE. Beach	Lake Erie	40I/5	11-Jun	0	0	1	No	No
31	Rondeau P. P. South Beach	Lake Erie	40I/5	11-Jun	0	0	3	No	No
33	Rondeau Provincial Park	Lake Erie	40I/5	17-Jun	0	0	2.4	No	No
25	Baie du Dore	Lake Huron	41A/5	6-Jun	0	0	1	No	No
12	Carter Bay	Lake Huron	41G/9	6-Jun	0	0	0.9	No	No
20	Chief's Point	Lake Huron	41A/14	10-Jun	0	0	6	No	No
15	Dorcas Bay, Singing Sands	Lake Huron	41H/4	16-Jun	0	0	2	No	No
29	Golf Course Rd. Pt. Farms	Lake Huron	40P/13	5-Jun	0	0	2.3	No	No
28	Golf Course Rd. Sunset B.	Lake Huron	40P/13	5-Jun	0	0	1.3	No	No
18	Hope Bay	Lake Huron	41A/14	13-Jun	0	0	2	No	No
14	Horseshoe Bay Gt. Duck Is.	Lake Huron	41G/10	7-Jun	0	0	0.4	No	0
13	Michael's Bay	Lake Huron	41G/9	6-Jun	0	0	0.8	No	No
23	Miramichi Bay	Lake Huron	41A/6	8-Jun	0	0	2	No	No
17	Myles Bay	Lake Huron	41A/14	13-Jun	0	0	2	No	No
27	Port Albert N.	Lake Huron	40P/13	4-Jun	0	0	3.3	No	No
30	Port Albert S. – Brindley	Lake Huron	40P/13	5-Jun	0	0	5.5	No	No
24	Port Elgin	Lake Huron	41A/5	6-Jun	0	0	6	No	No
10	Providence Bay	Lake Huron	41G/9	8-Jun	0	0	2.3	No	No
19	Red Bay/Howdenvale	Lake Huron	41A/14	13-Jun	0	0	3	No	No
21	Sauble Beach	Lake Huron	41A/14	10-Jun	0	0	6	No	No
22	Southampton	Lake Huron	41A/6	8-Jun	0	0	5	No	No
16	Stokes Bay	Lake Huron	41A/14	13-Jun	0	0	3	No	No

Table 1. Results of International Piping Plover Breeding Census in Ontario, 1991, 1996 &amp; 2001 (cont.)

Map #	Site	Lake	1:50,000 NTS Map Sheet	Date	2001 census			91 census (adults)	96 census (adults)
					No. pairs	No. adults	Distance surveyed (km)		
11	Timber Bay	Lake Huron	41G/9	6-Jun	0	0	0.3	No	No
26	Wasaga Beach Prov. Pk.	Lake Huron	41A/9		0	0	2.5	No	0
9	Desert Pt. Gt. Duck Isd.	Lake Huron	41G/10	7-Jun	0	0	1.2	No	0
8	West Duck Island	Lake Huron	41G/15	7-Jun	0	0	1.1	No	0
1	Big Island, Oshie Bay	Lake of the Woods	52E/2	10-Jun	0	0	3	No	0
2	Bigsby Island, Deep Bay	Lake of the Woods	52E/2	10-Jun	0	0	2	No	0
3	Sable Islands Prov. N.R.	Lake of the Woods	52D/15	11-Jun	0	0	6	5	0
4	Windy Point	Lake of the Woods	52D/15	10-Jun	0	1	0.5	0	3
5	Caribou Island	Lake Superior	41K/10	13-Jun	0	0	7.6	No	0
6	Driftwood Beach	Lake Superior	41N/15	14-Jun	0	0	2.2	No	No
7	Agawa Bay	Lake Superior	41N/7	16-Jun	0	0	3	No	0
Totals					0	2	125.3	5	3

Table 2 Number of Piping Plovers observed at Lake of the Woods, Ontario (1938-01)

Year	No. of adult Piping Plovers		
	Sable Islands	Windy Point	Total
1938	6	n.d. (b)	6
1974	5	n.d.	5
1978	5	n.d.	5
1979	2	4	6
1980	3	n.d.	3
1981	4	n.d.	4
1983	2	n.d.	2
1986	6	n.d.	6
1987	5	5	10
1988	3	n.d.	3
1989	6	2	8
1990	4	0	4
1991	5	0	5
1992	0	2	2
1993	1	0	1
1994	3	0	3
1995	0	3	3
1996	0	3	3
1997	1	4	5
1998	0	5	5
1999	0	4	4
2000	0	3	3
2001	0	1	1

n.d. = no data

## The 2001 Piping Plover census in Manitoba

Jennifer Stewart<sup>1</sup> and Ken DeSmet<sup>2</sup>

<sup>1</sup>Canadian Wildlife Service, Atlantic Region, 17 Waterfowl Lane, Sackville, New Brunswick, E4L 1G6

<sup>2</sup>Manitoba Conservation, Box 24, 200 Saulteaux Crescent, Winnipeg, MB R3J 3W3

### Abstract

A total of 16 Piping Plovers (*Charadrius melodus circumcinctus*) consisting of 7 breeding pairs and 2 singles were counted at 4 sites in Manitoba during the 2001 International Piping Plover Census. All Piping Plovers were at historical breeding sites and no new breeding sites were identified. Known Piping Plover nesting populations in Manitoba have decreased by 73% from the 1996 population estimate and by 80% from the 1991 population estimate. These declines can be attributed to habitat loss (as a result of water level fluctuations), weather, and human disturbance. Increased effort was put into searching beaches along the south shores of Lake Winnipeg during 2001. Much potential Piping Plover habitat was not surveyed along remote and inaccessible lakes in central Manitoba, or along remote shorelines and islands on Lakes Manitoba, Winnipeg and Winnipegosis. The challenge for future surveys will be to better identify and survey those potential breeding sites.

### Résumé

Seize Pluviers siffleurs, soit sept couples reproducteurs et deux oiseaux seuls, ont été recensés à quatre endroits au Manitoba durant le recensement international du Pluvier siffleur effectué en 2001. Tous les Pluviers siffleurs se trouvaient dans les lieux de reproduction habituels et aucun nouveau lieu de reproduction n'a été repéré. La population de Pluviers siffleurs a diminué de 73 p. 100 depuis les estimations découlant du recensement de 1996 et de 80 p. 100 depuis le recensement de 1991. Ce déclin est attribuable à une perte d'habitat engendrée par les fluctuations du niveau de l'eau, les changements climatiques et les perturbations causées par les humains. En 2001, un effort marqué de recherche a été déployé sur des plages de la berge sud du lac Winnipeg, mais beaucoup de terrains pouvant constituer un habitat pour le Pluvier siffleur se trouvent sur des rives éloignées et dans les îles des lacs Manitoba, Winnipeg et Winnipegosis. Lors des recensements futurs, il faudra veiller à mieux cerner les lieux de reproduction potentiels et à y effectuer des recensements.

### Introduction

Conservation efforts for the Piping Plover (*Charadrius melodus circumcinctus*) began in Manitoba during the early 1980's. Haig (1987) conducted widespread surveys of known and suitable nesting areas in the province from 1981-1985, which included extensive research on productivity, limiting factors, and movements of Piping Plovers on West Shoal Lake and parts of Lake Manitoba and Lake Winnipeg. Surveys of known sites and other suitable areas have been undertaken annually since then, however survey effort has varied considerably from year to year (Miller 2002).

In 1992, the Piping Plover was listed as Endangered by regulation 25/98 under the Manitoba Endangered Species Act. This provincial act is aimed at protecting the birds and their habitat and has provisions for restricting the entry into areas where the species is located. The Manitoba government has established two Special Conservation Areas (at Clandeboye Bay on the south basin of Lake Manitoba in 1992, and the Walter Cook Special Conservation Area at Long Point on Lake Winnipeg in 1994) to afford protection to breeding Piping Plovers at these prime locations. Although enclosure fences,

interpretive signs and extensive community education have been employed in both areas, these sites still occasionally experience problems with human disturbance (Miller 2002).

Habitat enhancement projects undertaken by the province have included the creation of nesting islands at West Shoal Lake and Oak Hammock Marsh, and habitat enhancement projects at Delta Marsh, Gull Bay and West Shoal Lake (Miller 2002). The Manitoba Piping Plover Guardian Program (supported by Manitoba Conservation) was put in place at Grand Beach Provincial Park in 1998 and helps protect breeding Piping Plovers through public education, by erecting symbolic fencing near nest sites, and by involving local volunteers in protecting nests. The importance of Piping Plovers and their management was recognized by the inclusion of guidelines to protect Piping Plovers in the Management Plan for Grand Beach Provincial Park (MB Conservation 2002). These guidelines call for park staff to work in cooperation with the Prairie Piping Plover Recovery Team to deliver an ongoing management and monitoring program for Piping Plover in the park as well as to implement amendments to park maintenance and operations as required to minimize disturbance to Piping Plovers during their nesting and fledging season.

This report outlines the results of the 2001 Manitoba Provincial Census and Piping Plover population trends within the province.

### Methods

The 2001 International Census took place in Manitoba from early to mid June. Sites were surveyed based on their previous usage by Piping Plovers, however many sites were not surveyed due to high water levels. Overall census effort in 2001 was lower than in 1991 and 1996. A total of 23 former, current, and potential breeding sites were surveyed in 2001, comprising 36.7 km of shoreline. This compares to 30 sites that were surveyed in 1996, and 45 (comprising 150 km of shoreline) surveyed in 1991.

There was increased census effort for beaches along the south shores of Lake Winnipeg. Most sites that had historical breeding activity were surveyed. Grand Marais Island, Kawinaw Lake and Gull Bay's south spit, all historical breeding sites, were not surveyed due to inclement weather and high lake levels.

Those who participated in the census were associated with Manitoba Conservation, the Canadian Wildlife Service, Ducks Unlimited, the Oak Hammock Wildlife Management Area, and the Green Team from Gimli. The Canadian Wildlife Service also collected productivity data for all nest sites on Grand Beach and Patricia Beach.

### Results

Of 23 sites surveyed during the 2001 census, 4 were active and a total of 16 adults (7 breeding pairs) were counted (Table 1). Of these sites, 3 are located on Lake Winnipeg: Gull Bay, Grand Beach and Patricia Beach. The fourth site, Clandeboy Bay, is on Lake Manitoba. Other sites that had small numbers of Piping Plovers in 1996, but none in 2001, included Hecla Island (Sandy Point), Elk Island, Grand Marais and Riverton Sand Islands (all on Lake Winnipeg). The lack of Piping Plovers at most of these sites was attributed to high lake levels and/or vegetation encroachment.

Clandeboy Bay on Lake Manitoba had the greatest number of Piping Plovers with 6 adults comprising 3 breeding pairs. Grand Beach on Lake Winnipeg had 5 adults comprising 2 breeding pairs and 1 single. The two remaining sites with Piping Plovers were Gull Bay Sandspit north (1 breeding pair and 1 single) and Patricia Beach (1 breeding pair).

There were 6 suitable stretches of beach that were surveyed for the first time during this census. These sites are Lynch Point on Lake Manitoba, and Albert Beach, Fishermen's Wharf, Hillside Beach,

Lester Beach, and Sandy Bay on Lake Winnipeg. No Piping Plovers were found on any of these beaches and no new breeding sites were identified during this census.

## Discussion

Known numbers of Piping Plovers detected during this census declined 73% from the 1996 census and 80% from 1991 census results. There are several possible reasons for these apparent population declines, including an incomplete census effort in 2001 due to inclement weather, and unusually high water levels in the last few years resulting in habitat loss. Additional threats to Piping Plovers in Manitoba include the loss of nesting habitat due to cottage development, the use of nesting beaches by cattle, all-terrain vehicles, sunbathers or other recreationists, encroachment of vegetation at a few former nesting sites, and the flooding of nests or feeding areas by periodic storms and high water levels (Koonz 1991; Koonz and Radowski 1985). In 2001, there were two storms in mid-May and mid-June which were believed to have adversely affected the census count and nesting success.

The most drastic population declines from 1996 to 2001 occurred on West Shoal Lake and at Gull Bay. Together these two sites accounted for a decline from 43 Piping Plovers in 1996 to 3 in 2001. Extremely high water levels at West Shoal Lake in recent years have resulted in the complete flooding of former Piping Plover breeding habitat. In 1996, there were 26 Piping Plovers and at least 10 pairs counted on the west shoreline and on artificial islands at this site and as many as 67 Piping Plovers were found there as recently as 1994 (DeSmet and Koonz 2002; Miller 2002). But increasing water levels have flooded all former nesting areas on this lake and there have not been any nesting Piping Plovers seen there since 1997. This habitat will remain unusable until water levels drop to pre-1996 levels. It is possible that some isolated pairs may nest in less suitable (partially vegetated) and inaccessible portions of the Shoal Lakes, but none were noted in more suitable habitat checked during the 2001 census (DeSmet and Koonz 2002).

Another prominent breeding area in 1996, Gull Bay on Lake Winnipeg, experienced an 80% decline in recorded population numbers from 1996 to 2001. Several factors may have contributed to this decline. One factor was disturbance caused by frequent use of all-terrain vehicles along the entire north sand bar (DeSmet and Koonz 2002). Another cause for population decline at this site could be displacement by other nesting birds; a new gull and tern colony was established on the southern tip of the north sand bar where the Piping Plovers historically nested. As a result of this colony, the Piping Plovers have begun nesting closer to where the fishermen camp, an area more prone to human disturbance. Since this site is well removed from other nesting areas, it is surveyed less frequently than others. By the time this site was initially checked in early June 2001, it is possible that many nesting Piping Plovers had already failed and moved (especially given the high water levels and an intense mid-May storm).

Other population declines were observed on Lake Winnipeg at the following sites: Hecla Island (Sandy Point), Elk Island, Grand Marais spit, and the Riverton Sand Islands. These sites had breeding activity in 1996 but none in 2001. These declines can be attributed to habitat loss due to high water levels and vegetation encroachment (DeSmet and Koonz 2002).

Efforts are being made to conserve Piping Plovers in Manitoba. Both the Grand Beach Interpreters and the Oak Hammock Marsh staff initiated educational efforts that included Piping Plover information displays in 2001. In addition, the Grand Beach Piping Plover guardian coordinator organized several educational programs for beach visitors and schools. Another conservation method used in Manitoba in 2001 included the use of a predator enclosure at Patricia Beach.

Manitoba's Piping Plover population is estimated to have ranged as high as 130 adults during the past two decades, but has declined steadily and precipitously since the early 1990s. It is unknown what percentage of Manitoba's entire population is being found or recorded annually and how Piping Plover movements from year to year have contributed to the observed declines at known sites (Miller 2002). It is currently felt that some, perhaps even many, additional Piping Plover pairs nest in suitable habitat



along remote and inaccessible lakes in central Manitoba, and especially along remote sandy shorelines and islands on Lakes Manitoba, Winnipeg and perhaps even Lake Winnipegosis (DeSmet and Koonz 2002). The challenge for future research and surveys in Manitoba will be to determine where populations disperse to during periods of high water, the availability and use of suitable habitat in remote or inaccessible areas, and the amount of immigration and emigration occurring with surrounding populations (Miller 2002). Only once these are known can the extent of apparent declines in Manitoba be assessed.

### **Acknowledgements**

The census effort would not have been possible without the participants who helped organize and conduct surveys. Many thanks go to Alexandra Miller (Canadian Wildlife Service), Robert Jones, Bill Koonz, Dan Chranowski and Dave Roberts (Manitoba Conservation), the Green Team staff and summer staff from Gimli, the Ducks Unlimited staff from Brandon, the students from the Canadian Wildlife Service, and the Oak Hammock Staff for their dedication in conducting the 2001 International Census.



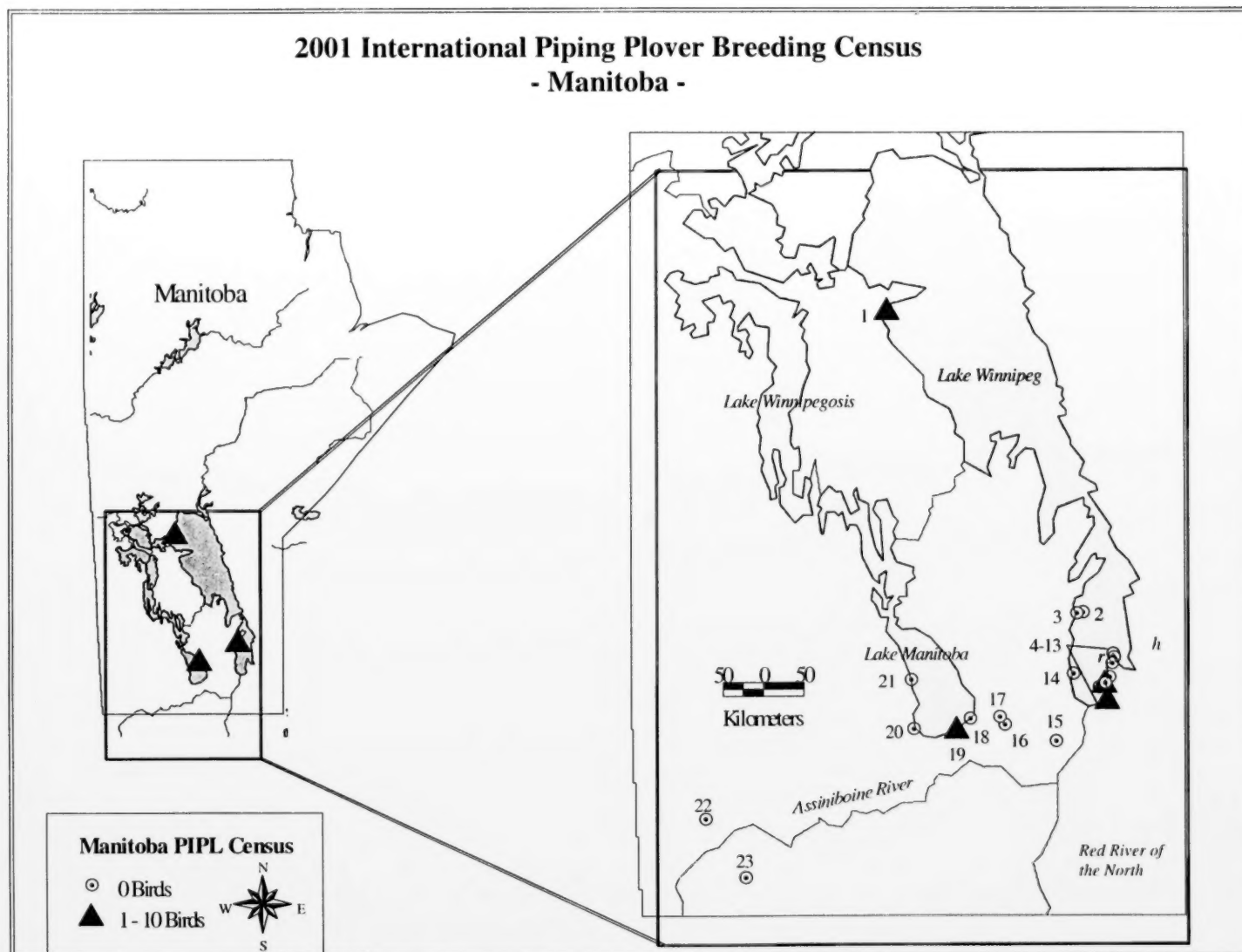


Figure 1. Distribution of Piping Plover in Manitoba during 2001 census.

Table 1. Results of 2001 International Piping Plover Breeding Census in Manitoba

Map #	Site	Region	Site Description	Date	2001 Census			91 Census	96 Census
					No. Pairs	No. Adults	Distance (km)		
19	Clandeboy Bay	Lake Manitoba	VI I 1,6	7-Jun	3	6	0.5	Yes	Yes
21	Hollywood Beach	Lake Manitoba	VI A 6	6-Jun	0	0	0.5	Yes	Yes
20	Lynch Point	Lake Manitoba	VI A 6	6-Jun	0	0	0.5	No	No
18	Twin Lakes Beach	Lake Manitoba	VI A 6	7-Jun	0	0	3.0	Yes	Yes
9	Albert Beach	Lake Winnipeg	VI A 6	12-Jun	0	0	0.5	No	No
13	Beaconia Beach	Lake Winnipeg	VI A 1,6,12	7-Jun	0	0	1.6	Unknown	Unknown
4	Elk Island	Lake Winnipeg	VI E 1,4,6,10,12	21-Jun	0	0	4.0	Yes	Yes
10	Fisherman's Wharf	Lake Winnipeg	VI D 2	3-Jun	0	0	0.8	No	No
11	Grand Beach	Lake Winnipeg	II, VI A 1,12	14-Jun	2	5	3.0	Yes	Yes
	Gull Bay Sandspit,								
1	North	Lake Winnipeg	VI B 2,6,13	5-Jun	1	3	6.0	Unknown	Yes
2	Hecla Island Sandspit	Lake Winnipeg	VI E 2	7-Jun	0	0	0.5	Yes	Yes
6	Hillside Beach	Lake Winnipeg	VI A 1	12-Jun	0	0	1.0	No	No
8	Lester Beach	Lake Winnipeg	VI A 1,6	15-Jun	0	0	1.0	No	No
12	Patricia Beach	Lake Winnipeg	VI A 1,6	7-Jun	1	2	2.9	Yes	Yes
3	Riverton Sand Islands	Lake Winnipeg	VI F 2	7-Jun	0	0	0.3	Yes	Yes
5	Sandy Bay	Lake Winnipeg	VI A 1,10,12	12-Jun	0	0	1.9	No	No
7	Victoria Beach	Lake Winnipeg	VI A 1	12-Jun	0	0	1.2	No	Yes
14	Willow Island	Lake Winnipeg	VI A 6	7-Jun	0	0	1.0	Yes	Unknown
15	Oak Hammock	Oak Hammock Marsh	III E 6	4-Jun	0	0	0.5	Unknown	Unknown
22	Oak Lake	Oak Lake	VI A 1	6-Jun	0	0	0.5	Yes	Unknown
	West Shoal Lake (south								
16	end)	Shoal Lake	VI A 6	4-Jun	0	0	2.5	Yes	Yes
	West Shoal Lake (west								
17	side point)	Shoal Lake	VI A 6	4-Jun	0	0	1.0	Yes	Yes
23	Whitewater Lake	Whitewater Lake	VI A 6	7-Jun	0	0	2.0	Yes	No
<b>Total</b>					<b>7</b>	<b>16</b>	<b>36.7</b>		

## The 2001 Piping Plover census in Saskatchewan

Lori Dunlop

*Nature Saskatchewan, Room 206, 1860 Lorne Street, Regina, Saskatchewan S4P 2L7*

### Abstract

The 2001 International Piping Plover Census in Saskatchewan took place during 1-20 June 2001. Methodology remained consistent over the three International surveys to ensure comparability of results. Approximately 95% of the known Piping Plover habitat in Saskatchewan was searched by 165 surveyors.

A total of 805 adult Piping Plovers were counted in Saskatchewan, a 40% decrease from 1996 (1348 birds) and a 31% decrease from 1991 (1172 birds). Of the birds counted in 2001, 53% were paired, compared to 79% in 1996 and 82% in 1991. The number of Piping Plovers in Saskatchewan accounted for 27% of the total across the Great Plains (2966 birds; preliminary number; C. Ferland pers. comm.), down from 41% of the 1996 total (3284 birds), and 33.% of the 1991 total (3469 birds).

Piping Plovers were seen at 64 of the 310 surveyed basins in 2001, with the top four providing 56% of the Saskatchewan total (Lake Diefenbaker: 201, Big Quill Lake: 105, Chaplin Lake: 105, and Willowbunch Lake: 41). Four sites accounted for 55% of the population in the 1991 census, while three sites accounted for 57% of the 1996 population. The Missouri Coteau (excluding Chaplin and Willowbunch lakes) had a combined total of 149 birds (18% of the provincial total). By including Chaplin and Willowbunch lakes, the Missouri Coteau accounted for a total of 295 birds (37% of the provincial total).

### Résumé

En Saskatchewan, le recensement international de 2001 a eu lieu du 1<sup>er</sup> au 20 juin 2001. La méthodologie est demeurée inchangée pendant les trois recensements internationaux, ce qui assure la comparabilité des résultats. En tout, 165 recenseurs ont surveillé environ 95 % de l'habitat connu du Pluvier siffleur dans cette province.

Les recenseurs ont dénombré 805 adultes, ce qui représente une baisse de 40,3 % par rapport à 1996 (1 348 oiseaux) et de 31,3 % par rapport à 1991 (1 172 oiseaux). Des oiseaux dénombrés en 2001, 52,7 % avaient un partenaire, comparativement à 79,2 % en 1996 et à 82,1 % en 1991. Le nombre d'individus observés en Saskatchewan comptait pour 27,1 % du nombre total de pluviers recensés dans les Prairies (2 966 oiseaux; chiffre préliminaire; C. Ferland, comm. pers.). C'est là une baisse de 41,1 % par rapport au total enregistré en 1996 (3 284 oiseaux) et de 33,8 % par rapport au total de 1991 (3 469 oiseaux).

Des 310 bassins d'eau surveillés en 2001, 64 abritaient des pluviers, les quatre principaux renfermant 56,2 % de la population totale de la Saskatchewan (lac Diefenbaker : 201; lac Big Quill : 105; lac Chaplin : 105; lac Willowbunch : 41). Lors du recensement de 1991, quatre sites servaient d'habitat à 54,7 % de la population, et, lors du recensement de 1996, trois sites représentaient 56,7 % de la population. Le coteau Missouri (à l'exclusion des lacs Chaplin et Willowbunch) comptait au total 149 oiseaux (18,5 % du total provincial). Avec les lacs Chaplin et Willowbunch, le coteau Missouri abritait au total 295 oiseaux (36,7 % du total provincial).

## Introduction

The Piping Plover (*Charadrius melodus circumcinctus*) is a migratory shorebird that inhabits gravelly and sandy shorelines of central and eastern Canada and adjoining areas of the United States. Unlike the majority of shorebird species which breed in the remote arctic and winter in South America, the Piping Plover breeds and winters primarily in the temperate regions of North America. In 1945, this species began a decline that continues today. It was listed as "threatened" in 1978 by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), and in 1985 its status was upgraded to "endangered" (Haig 1985). In 2001, the two subspecies were listed separately as endangered in Canada (P. Goossen pers. comm.).

In order to study population and migration trends and to identify breeding habitats, the Canadian and U.S. Piping Plover recovery teams established international census guidelines to be followed every five years (Skeel 1991). The first complete census was undertaken in 1991. The total population at that time was 5488 birds, of which approximately 21.4% (1172 birds) were located in Saskatchewan. A second International census occurred in 1996, and revealed the total count to be 5913, with approximately 22.8% (1348 birds) of the population occurring in Saskatchewan (Skeel 1996).

Nature Saskatchewan and the Fish and Wildlife Branch of Saskatchewan Environment and Resource Management (SERM) co-ordinated the Saskatchewan component of the 2001 International Piping Plover Breeding Census. In Saskatchewan alone, approximately 310 drainage basins were surveyed by government personnel, environmental agencies, contractors and volunteers (165 surveyors in total). The census occurred 1 to 20 June, with 1 to 10 June as the primary period.

As a result of information collected during the previous two censuses, conservation and recovery efforts were initiated at a number of waterbodies important to Piping Plovers. These efforts have included increasing public and landowner awareness, fencing high-use shoreline habitat from cattle, and colour-banding chicks to determine migration patterns. One of the goals of the 2001 census was to provide essential insight into the population and migration trends of this species, thus highlighting important habitats for future conservation activities.

## Methods

Most of the breeding sites in Saskatchewan consist of shoreline and flat areas around alkali lakes, but shorelines of large freshwater lakes, river islands, reservoirs, and industrial ponds are also suitable (Haig and Plissner 1996). The most heavily populated sites are sandy or gravelly, but silty sites are utilized as well (Harris *et al.* 1985).

Site selection for the Saskatchewan portion of the 2001 International Piping Plover Census was determined primarily through the analysis of previous International Census results. The chosen sites were divided into three categories:

1. High Priority - included basins which had Piping Plovers during the 1996 census;
2. Low Priority - included basins which did not have Piping Plovers during 1996, but had suitable habitat and may or may not have had Piping Plovers in the 1991 census; and
3. Missouri Coteau - included the multitude of small lakes and potholes found within this geographic region of southern Saskatchewan.

During May of 1991 and 1996, aerial surveys were flown over the Missouri Coteau to determine which basins contained suitable habitat and should be surveyed. As it was likely that all, or close to all, suitable basins had previously been identified, and due to financial constraints, it was decided that a flight would not be undertaken in 2001. Instead, all basins identified as having suitable habitat in either 1991 and/or 1996 were assigned to surveyors.

Surveyors participating in the census included agency personnel, contractors, and volunteers. Both government and non-government agencies provided valuable support by surveying those water basins throughout the province which had previous Piping Plover records as well as those found in the Missouri Coteau. Larger basins with recent records of Piping Plovers were divided into manageable blocks and tendered out to qualified surveyors. Volunteers were enlisted to survey the remaining sites, which consisted primarily of smaller basins containing suitable habitat but no records (or no recent records) of Piping Plovers.

Survey protocol followed the methods used in 1991 and 1996 to ensure comparable results. Assessment of habitat condition was given special emphasis in order to provide the basis for future stewardship work with landowners. General survey guidelines were detailed in a methodology handout and included the following points:

- suitable habitat of basin shoreline was surveyed wherever possible;
- surveyors reported all observations of paired and unpaired adults;
- surveyors restricted their time within any one Piping Plover territory to a maximum of 5 minutes;
- surveys were not to be conducted under extreme weather conditions;
- emphasis was given to high quality habitat (i.e., gravelly shorelines, beaches and areas where Piping Plovers were located previously); and
- where water levels had changed, new habitat was to be marked on maps (1:50,000 scale) to facilitate future stewardship work.

Individual Census Reports and Habitat Evaluation Forms were completed in the field as each basin was surveyed. Individual Census Report Forms, provided by the International Census Co-ordinator, were filled out for all basins regardless of whether or not Piping Plovers were seen. Habitat Evaluation Forms were designed in co-operation with the Saskatchewan Wetland Conservation Corporation (SWCC) and provided valuable information regarding site quality and possible threats to Piping Plovers.

### Results

The Saskatchewan portion of the 2001 International Piping Plover Census took place 1 to 20 June 2001. During this period, 805 adult Piping Plovers were counted across the province. This total represents a 40% decrease in Saskatchewan from the 1996 total of 1348 birds, and a 31% decrease from the 1991 total of 1172 birds. Of the 805 Piping Plovers counted in 2001, 424 (53%) were paired. This compares to 79% in 1996 and 82% in 1991. Surveyors did not actively search for nests.

The 310 Saskatchewan sites surveyed in 2001 encompass an estimated 95% of known Piping Plover habitat. The 165 surveyors who assisted in the census (56 volunteers, 10 contractors, 73 government and NGO biologists, and 26 summer students) covered 2552 km of shoreline habitat in their search for this endangered bird, resulting in a density of nearly 1 bird per 3 shoreline km, or 0.32 birds per km.

Piping Plovers were spotted at 64 of the surveyed basins (Table 1), with the top four basins providing 56% (452 individuals) of the Saskatchewan total. These sites were Lake Diefenbaker with 201 adults, Big Quill Lake with 105 adults, Chaplin Lake with 105 adults and Willowbunch Lake with 41 adults.

Four sites (Lake Diefenbaker, Big Quill Lake, Manitou Lake and Chaplin Lake) accounted for 55% of the 1991 population, while three sites (Big Quill Lake, Chaplin Lake and Willowbunch Lake) accounted for 57% of the 1996 population, denoting a more concentrated population that year. The Missouri Coteau (excluding Chaplin and Willowbunch lakes) had a combined total of 149 birds in 2001 (19% of the provincial total). By including Chaplin and Willowbunch lakes, 295 birds (37% of the provincial total) were found in the Missouri Coteau this year. The 2001 distribution map for



Saskatchewan (Figure 1) clearly illustrates the concentration of Piping Plovers at the top four sites and throughout the Missouri Coteau.

Saskatchewan accounted for 14% of the total 2001 North American count (5938 birds; preliminary number; C. Ferland pers. comm.), decreasing from 23% of the 1996 total (5913 birds) and 21% of the 1991 total (5488 birds). Lake Diefenbaker comprised 7% of the 2001 Great Plains number (2966 birds), whereas Big Quill and Chaplin lakes each accounted for 4%.

### Discussion

Saskatchewan remains one of the most important areas for Piping Plover in the Great Plains (Smith 1996). However, Saskatchewan results from the 2001 International Piping Plover Census were substantially lower than results of 1991 and 1996. It is estimated that 96% of known Piping Plover habitat was censused in 2001. There may still be some unknown sites, but they would not likely contribute significantly to the Saskatchewan total. A few sites in northern and western portions of the province may be dropped during future surveys based on a lack of suitable habitat.

During the 2001 census, some birds were sighted in "non-traditional" habitats, such as in vegetated and/or partially vegetated sites as well as near dry basins (W. Harris pers. comm.). As a result, an extension of the current search pattern may be in order for future surveys. Also, since Piping Plovers may only voice their trademark "peep-lo" call infrequently, some birds may go undetected. It is important to train censusers to listen carefully for an initial or sporadic call, and also to be visually alert. High winds during the survey period may have hindered surveyors' efforts by muting calls and making visual sightings more difficult.

The habitat information gained from surveyors' remarks on the 1:50,000 topographic maps as well as from the Habitat Evaluation Forms has proven invaluable. SWCC is currently compiling this information into a database containing critical habitat polygons for Piping Plovers. Each polygon will be tagged with data from the 1991, 1996 and 2001 censuses including Piping Plover locations, potential threats and adjacent landscape characteristics (S. Davis pers. comm.).

Important factors affecting Piping Plover numbers and survey results include water levels, vegetation growth and wind. Drought conditions across the majority of Saskatchewan left many small basins completely dry in 2001. As well, low water levels in recent years allowed vegetation to infringe upon beach areas.

In spite of these factors, there was adequate nesting habitat on many major water basins across the province. Yet Piping Plover numbers were still considerably lower than in previous years (W. Harris pers. comm.). Therefore, it is possible that the excellent habitat conditions in portions of the U.S. Northern Great Plains contributed to Piping Plovers short stopping and not continuing into the Canadian prairies. The Missouri River, for example, had an outstanding habitat situation in 2001 as a result of flooding in 1996 and 1997 that scoured the river and exposed a tremendous amount of sandbar habitat (C. Ferland pers. comm.). In 2001, a substantial population increase of 382 adults (24%) was reported in the US portion of the Northern Great Plains, whereas a substantial decline of 715 (42%) adults was observed in Prairie Canada (Ferland and Haig 2002).

An international census is the best method by which to monitor a continental migratory species, especially one that changes nesting locations in response to habitat conditions. Having a "snapshot" of the population status every five years provides a good indication of trends over time, particularly where annual surveys are not feasible. However, additional censuses will be required to document real population trends. A better understanding of population change will aid in evaluating the effectiveness of conservation programs and may identify a need for different approaches.

Effective management requires knowledge of migration and breeding chronologies, habitat use, food requirements and foraging modes (Helmers 1992). In order to achieve the ultimate goal of protecting

the Piping Plover and its habitat, while increasing its fledgling rate, certain recovery actions need to be implemented.

Recovery teams have been established in order to review the biology, population status and distribution of Piping Plovers. Action plans aimed at protecting and managing nesting areas, maintaining habitat quality and protecting birds from disturbance at critical times in their breeding season have been outlined. Current efforts in Saskatchewan include public education, fencing, nest enclosure studies, visibility indices, leg bands, and water regulation at reservoirs.

Piping Plovers are in direct competition with people for open sand, sandbars and pebble beaches, especially in June and July. Cooperation of landowners, government, private agencies and an informed public are needed in order to mitigate these impacts. Media coverage during all three International Censuses has been aimed at increasing public awareness of the Piping Plover's plight.

Trampling by cattle can result in damage to both chicks and nest sites. As well, chicks are occasionally unable to climb out of the deep footprints left by cattle. Sensitive habitat needs to be identified and fenced off to reduce disturbance and prevent further degradation of habitat. Although some fencing occurred following the 1991 census, no additional fencing for Piping Plover conservation occurred following the 1996 census.

Nest enclosures have been utilized in both Saskatchewan and Alberta to keep out predators such as gulls, skunks, cats, dogs, raccoons, foxes, and crows (Michaud and Prescott 1999). Studies are ongoing to determine the effectiveness of these devices (Engley and Michaud 2000). As high costs are involved, a range-wide management plan is needed to determine and implement optimal predator exclusions (Larson 2001).

Piping Plovers utilize camouflage very effectively as a survival strategy and as such may be missed by both inexperienced and experienced observers. At two basins in Saskatchewan (Lake Diefenbaker and Chaplin Lake), researchers from SWCC have set up experiments to determine a visibility correction factor. Future correction factor "tests" may take basin size (i.e., small vs. large), basin type (i.e., freshwater vs. alkali) and habitat type (i.e., typical vs. non-typical) into consideration (H. Armbruster pers. comm.).

Leg bands have also been used by several agencies in provinces and states across the Great Plains. Bands provide valuable information regarding movement and reproductive success. Banding of chicks with standard metal bands and color bands has occurred annually at Lake Diefenbaker since the 1996 census.

Nests built along the shores of reservoirs are subject to flooding at inopportune times. Sask Water Corporation, SaskPower Corporation, Environment Canada, and SERM are collaborating on a conservation plan to establish management and mitigation actions, which will benefit plovers' reproductive success at Lake Diefenbaker (P. Goossen pers. comm.).

Endangered species are often an indication that an ecosystem is in trouble. The Piping Plover was the primary target species of this census; however, it is not the only species that inhabits shorelines. Many prairie and arctic nesting shorebirds and waterfowl, as well as arthropods and other riparian species, are affected by human encroachment on shorelines, and are, or may soon be, in decline. By conserving these areas for Piping Plovers, other species that rely on them should benefit as well.

### Acknowledgements

This project was made possible through the financial support of the Canadian Wildlife Service (CWS, Environment Canada), Saskatchewan Environment and Resource Management (SERM), SaskPower Corporation, Enbridge Inc., the Endangered Species Recovery Fund (World Wildlife Fund Canada and Environment Canada), and ELSA Wild Animal Appeal of Canada. Environment Canada, SERM, Saskatchewan Wetland Conservation Corporation (SWCC), Nature Saskatchewan (NS, which received funding from Sask Lotteries), and Ducks Unlimited Canada (DUC) all provided invaluable personnel support, without which a survey of this magnitude could not have been undertaken.



Many people contributed to the success of this project. Thanks go out to Earl Wiltse (SERM) and Margaret Skeel (NS) for their invaluable technical and advisory support, Stephen Davis (SWCC) for his input regarding habitat data, Dave Prescott (ACA) for his collaboration on border lakes, Jeff Keith (Saskatchewan Conservation Data Centre) for the distribution maps, and Harry Armbruster, Ursula Banasch, John Dunlop, and Paul Goossen (all of CWS) for their instrumental comments regarding this report.

Participants in the census (56 volunteers, 10 contractors, 73 government and NGO biologists, and 26 summer students) included: Kristena Aadland, Nelson Ackerman, Bill Aitken, Gholam Alaie, Hazel Amberson, Harry Ambruster, Al Arsenault, Murray Ball, Ursula Banasch, James Barth, Ron Bazin, Leo Belanger, Sophie Belanger, Barry Bell, Gerald Beyersbergen, Evelyn Boon, Ken Born, Ryan Boyle, Karl Breker, Gregg Brewster, Michele Bryenton, Gord Burrows, Bob Cameron, Lucelle Cameron, Bob Carles, Muriel Carlson, Tanya Casey, Gene Chu, Darcy Cleasby, Krista Connick, Nancy Coomber, Lisa Crowe, Stephen Davis, Ross Dickson, Rick Douslin, Fern Dowse, Katherine Drake, Julie Dukat, John Dunlop, Lori Dunlop, Gary Dunn, Michael Ector, Dawni Erlacher, Rick Espie, Azure-Dee Farago, Marcel Ferland, Calvin Fiala, Estelle Finley, Kim Finley, Kevin Fitzsimonds, Brenda Flood, Velma Foster, Lori Fuller, Mike Gollop, Byron Golly, Stuart Golly, Paul Goossen, Genny Greif, Al Gurnsey, Joyce Gurnsey, Andrew Hak, Shelly Hansen, Val Harris, Wayne Harris, Scott Harvey, Kerry Hecker, Brian Hepworth, Alycia Herauf, Trevor Herriot, Dale Hjertaas, Paule Hjertaas, Phyllis Ilsley, Katherine Jacobson, Adri Joel, Heiki Johnson, Mark Johnson, Dora Knutson, Joseph Kotlar, Dorine Kreuger, Walter Kreuger, Brody Langager, Tony Lau, Arlyne Lawson, Ella Leiter, Rudy Leiter, Lionel Leston, Tracy Ma, Joan Makaroff, Bruce Martin, Nolan Mathies, Llewellyn Matthews, Greg McClelland, Mary McGillvray, Edith McHattie, Don McInnes, Glen McMaster, Melissa McMillan, Jen Merkowsky, Boyd Metzler, Jocelyn Montgomery, Jean Ann Mowchenko, Len Mowchenko, Melissa Naka, Bob Neufeld, Tim Neumann, Cuyler Onclin, Joni Onclin, Chad Park, Taylor Peck, Jeanette Pepper, Guy Perrin, Jerry Pilney, Christine Poley-McTavish, John Polluck, Steve Porter, David Potruff, Karen Pretzer, Gary Provencher, Katherine Rasmussen, Dorothy Rhead, Ingse Saetare, Colin Saker, Pat Sargeant, Dan Sawatzky, Karyn Scalise, Roy Schmelzeisen, Adam Schmidt, Arnie Schmidt, Tara Schmidt, A. Schoonmaker, Chad Sherman, Margaret Skeel, Al Smith, Gord Smoliak, Joan Soggie, Michelle Spence, Velma Spizawka, Irene Stinson, Steven Stire, Lowell Strauss, Elva Stronski, Kyle Stronski, Lorne Sullivan, Magel Sutherland, Jan Tedesco, M. Tether, Arnold Theissen, Cory Thody, Brad Tokarud, Joel Ulmer, Andrew Urzada, Dan Vetter, Kirk Wallace, Lindsay Wankel, Sharilyn Westworth, Brandy Wheatcroft, Brent Wig, Amanda Williams, Earl Wiltse, Kerry Wisser, Gary Wood, Laraine Wood, Kerry Wrishko, Jerod Yasinowski, and Michelle Yaskovich.

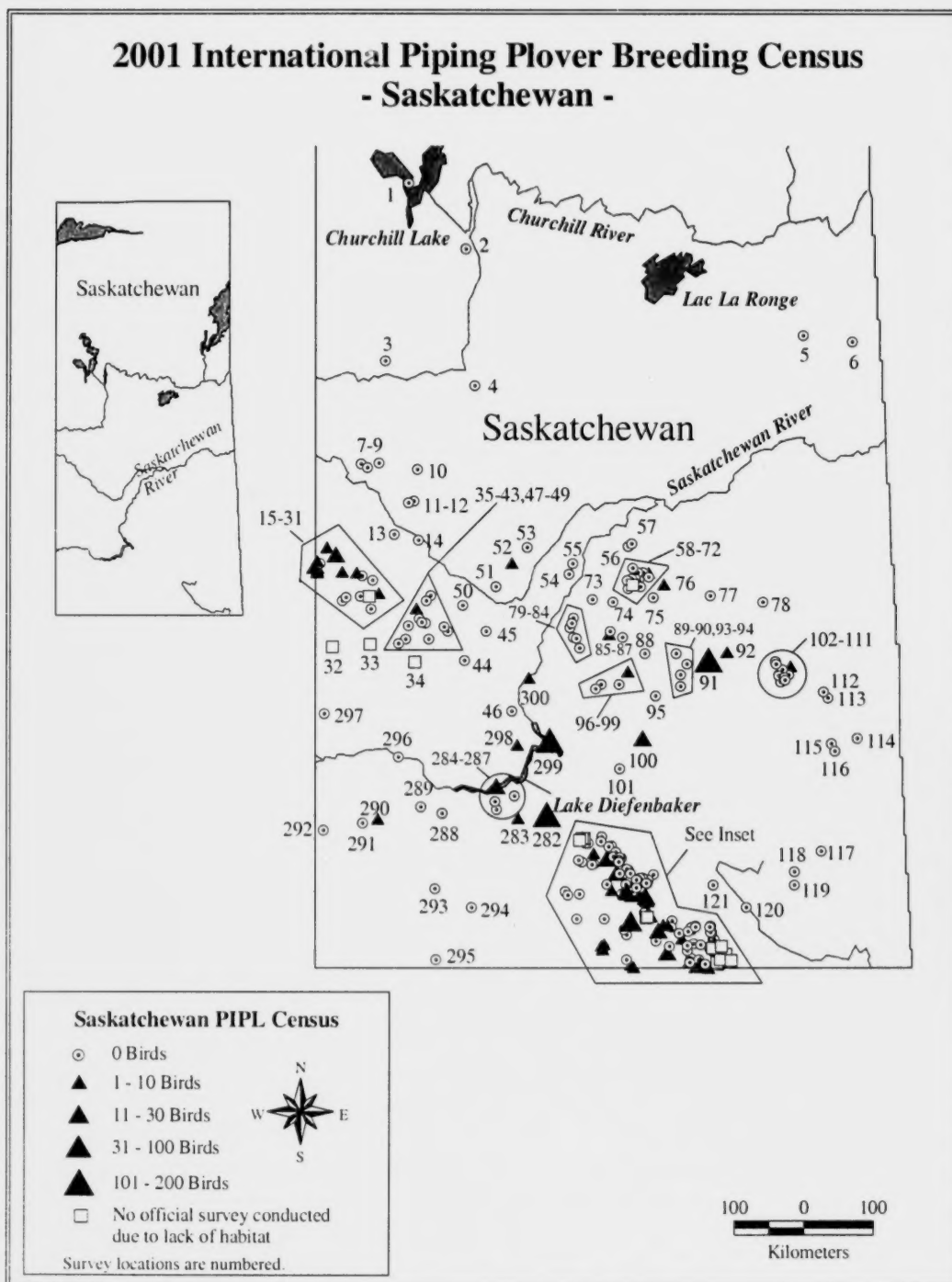


Figure 1. Distribution of Piping Plover in Saskatchewan during 2001 census.

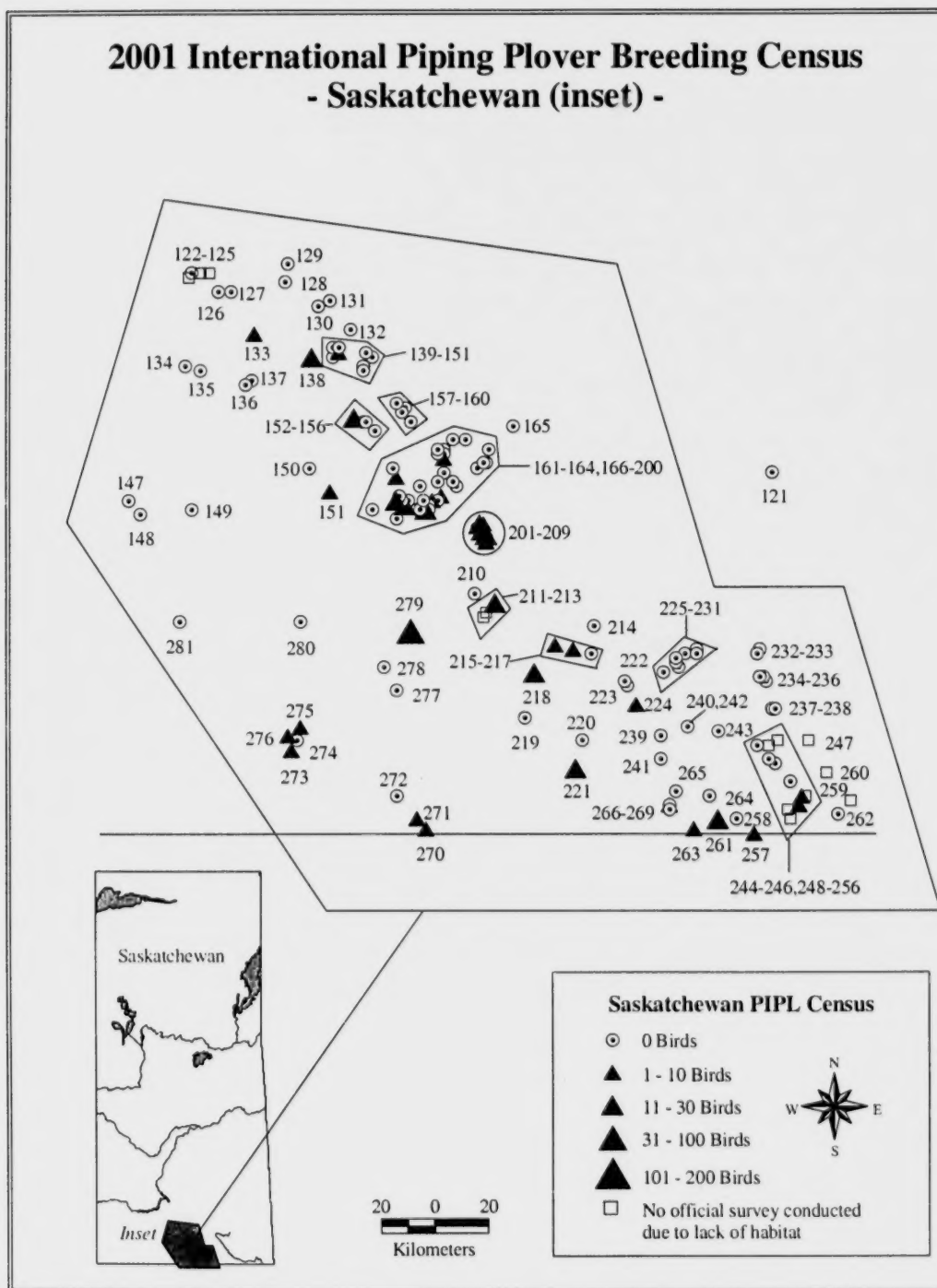


Figure 2. Distribution of Piping Plover in Saskatchewan during 2001 census (inset).

Table 1. Results of 2001 International Piping Plover Breeding Census in Saskatchewan

			2001 census									
Map # Site		Region	1:50,000 NTS Map Sheet (s)	Date	No. of pairs	No. of adults	Distance surveyed (km)	Habitat quality	Water level	91 census	96 census	
91	Big Quill L.	Big Quill/Last Mtn.	72P/16,15;73A/1	1-Jun	17	105	120	fair-good	low-ave.	Yes	Yes	
110	Bitter Lake	Big Quill/Last Mtn.		3-Jun	0	0	3.5			Yes	Yes	
90	Borrow Pit (3 mi. E. of Janzen on Hwy. 16)	Big Quill/Last Mtn.		9-Jun	0	0	0.8			Yes	Yes	
98	Bultel Lake	Big Quill/Last Mtn.		13-Jun	0	0	4			Yes	Yes	
95	Colt Lake	Big Quill/Last Mtn.		2-Jun	0	0	5			Yes	Yes	
97	Devil's Lake	Big Quill/Last Mtn.		12-Jun	0	0	12			Yes	Yes	
104	Dog Lake	Big Quill/Last Mtn.		14-Jun	0	0	2			Yes	Yes	
109	Echo Lake	Big Quill/Last Mtn.		8-Jun	0	0	9.8			Yes	Yes	
99	Horseshoe Lake	Big Quill/Last Mtn.		13-Jun	0	0	4			Yes	Yes	
89	Jansen Lake	Big Quill/Last Mtn.		13-Jun	0	0	25			Yes	Yes	
94	Kutawagan Lake Complex	Big Quill/Last Mtn.		10-Jun	0	0	16			Yes	Yes	
93	Lac du Chemin	Big Quill/Last Mtn.		10-Jun	0	0	3.2			Yes	Yes	
100	Last Mountain L.	Big Quill/Last Mtn.	72P/6,3;72I/14	14-Jun	7	17	37	poor	low-dry	Yes	Yes	
96	Little Manitou L.	Big Quill/Last Mtn.	72P/11,12,13	9-Jun	0	1	11.5	fair		Yes	Yes	
92	Little Quill L.	Big Quill/Last Mtn.	72P/16;62M/13	3-Jun	0	1	26.5	fair		Yes	Yes	
101	Lovering Lake East	Big Quill/Last Mtn.		13-Jun	0	0	3			Yes	Yes	
102	Margo Lake	Big Quill/Last Mtn.		14-Jun	0	0	5			Yes	Yes	
106	Newburn Lake	Big Quill/Last Mtn.		8-Jun	0	0	5.6			Yes	Yes	
111	Salt Lake	Big Quill/Last Mtn.		4-Jun	0	0	2.5			Yes	Yes	
107	Silver Lake	Big Quill/Last Mtn.		4-Jun	0	0	1			Yes	Yes	
103	Usinneskaw Lake	Big Quill/Last Mtn.		4-Jun	0	0	1			Yes	Yes	
88	UTM 832 482	Big Quill/Last Mtn.		12-Jun	0	0	6			Yes	Yes	
108	Woody Lake	Big Quill/Last Mtn.		8-Jun	0	0	2.9			Yes	Yes	

## 2001 Piping Plover Census

Table 1. Results of 2001 International Piping Plover Breeding Census in Saskatchewan (cont.)

Map #	Site	Region	1:50,000 NTS Map Sheet (s)	2001 census							
				Date	No. of pairs	No. of adults	Distance surveyed (km)	Habitat quality	Water level	91 census	96 census
275	400 535	Missouri Coteau	72H/4	4-Jun	1	2	3	poor-fair	low-ave.	Yes	Yes
141	503 440	Missouri Coteau	72I/4	7-Jun	1	2	4.8	average	ave	Yes	Yes
152	540 279	Missouri Coteau	72H/13	7-Jun	4	11	4	fair	low	Yes	Yes
253	613 345	Missouri Coteau	72H/1	12-Jun	0	1	1.5	poor	high	Yes	Yes
254	613 353	Missouri Coteau	72H/1	12-Jun	0	1	0.8	poor	high	Yes	Yes
270	702 290	Missouri Coteau	72H/3	4-Jun	1	2	2.5	fair	ave.	No	Yes
190	705 056	Missouri Coteau	72H/11	8-Jun	3	24	5	fair-good	low-dry	Yes	Yes
185	725 075	Missouri Coteau	72H/11	4-Jun	0	1	2	poor	low-dry	Yes	Yes
171	740 181	Missouri Coteau	72H/14	5-Jun	0	1	2	fair	ave.	Yes	No
202	840 020	Missouri Coteau	72H/11	6-Jun	5	13	4	fair-good	low-ave.	Yes	Yes
204	841 995	Missouri Coteau	72H/11	7-Jun	0	1	3	fair	low-ave.	Yes	Yes
203	842 027	Missouri Coteau	72H/11	6-Jun	1	5	3.5	n/a	dry	Yes	Yes
209	846 992	Missouri Coteau	72H/11	6-Jun	1	8	3.6	fair	high	Yes	Yes
208	856 984	Missouri Coteau	72H/11	6-Jun	1	2	1.5	fair		No	Yes
205	860 985	Missouri Coteau	72H/11	6-Jun	0	1	1	fair	low-dry	No	Yes
158	Agnellice Lake (UTM 660 300)	Missouri Coteau		8-Jun	0	0	0.1			Yes	Yes
257	Alkali L.	Missouri Coteau	72H/1	7-Jun	2	6	6	poor	high	Yes	Yes
245	Alma Lake	Missouri Coteau		nc				poor		Yes	No
217	Bead Lake	Missouri Coteau		6-Jun	0	0	2			Yes	Yes
260	Beaubien Lake	Missouri Coteau		nc				poor		Yes	No
221	Big Muddy L.	Missouri Coteau	72H/2	3-Jun	3	16	35	fair	low	Yes	Yes
182	Bliss L.	Missouri Coteau	72H/13	7-Jun	2	8	8	fair	low	Yes	Yes
278	Bonneau Lake	Missouri Coteau		3-Jun	0	0	7			Yes	Yes
235	Bowden Lake	Missouri Coteau		4-Jun	0	0	0.4			No	Yes
219	Bulkin Lake	Missouri Coteau		4-Jun	0	0	6.5			Yes	Yes
194	Burn L.	Missouri Coteau	72H/11	4-Jun	3	11	9.5	fair	low-dry	Yes	Yes

## 2001 Piping Plover Census

Table 1. Results of 2001 International Piping Plover Breeding Census in Saskatchewan (cont.)

Map #	Site	Region	1:50,000 NTS Map Sheet (s)	2001 census							91 census	96 census
				Date	No. of pairs	No. of adults	Distance surveyed (km)	Habitat quality	Water level			
210	Channel Lake	Missouri Coteau		5-Jun	0	0	13			Yes	Yes	
282	Chaplin L.	Missouri Coteau	72J/7,1,2,8	9-Jun	26	105	95.5	good	ave.	Yes	Yes	
218	Coal Mine L.	Missouri Coteau	72H/6	5-Jun	5	12	8	fair-good	ave.	Yes	Yes	
272	Coronach Reservoir	Missouri Coteau		3-Jun	0	0	0.1			Yes	Yes	
266	Coteau Pots	Missouri Coteau	72H/2	7-Jun	0	1	0.5	fair	low-ave.	Yes	Yes	
267	Coteau Pots (UTM 300 342)	Missouri Coteau		7-Jun	0	0	0.5			Yes	Yes	
268	Coteau Pots (UTM 300 350)	Missouri Coteau		7-Jun	0	0	0.5			Yes	Yes	
271	Crookstow R.	Missouri Coteau	72H/3	4-Jun	1	2	4.5	fair	high	Yes	No	
198	Dryboro L.	Missouri Coteau	72H/11	7-Jun	1	16	6	fair	low-dry	Yes	Yes	
142	Dunkirk Lake (UTM 490 432)	Missouri Coteau		6-Jun	0	0	1.7			Yes	No	
261	East Coteau L.	Missouri Coteau	72H/1	6-Jun	6	19	8	fair-good	low-ave.	Yes	Yes	
216	Edna L.	Missouri Coteau	72H/7	6-Jun	0	3	9	fair	low-ave.	Yes	Yes	
228	Elsie Lake	Missouri Coteau		n.r.	0	0	4			Yes	Yes	
276	Fife L.	Missouri Coteau	72H/4,5	16-Jun	3	7	16	poor	high	Yes	Yes	
138	Frederick L.	Missouri Coteau	72I/4	7-Jun	2	12	8	poor	low-dry	Yes	Yes	
273	Grant L.	Missouri Coteau	72H/4	4-Jun	0	1	3	fair	low	Yes	Yes	
214	Green Lake	Missouri Coteau		6-Jun	0	0	2.5			Yes	Yes	
285	Handsome Lake	Missouri Coteau		16-Jun	0	0	12			Yes	Yes	
211	Horizon L.	Missouri Coteau	72H/6,11	4-Jun	4	18	10	poor-fair	low-ave.	No	Yes	
145	Howe Pond (UTM 556 388)	Missouri Coteau		6-Jun	0	0	0.9			Yes	Yes	
264	Jim Creek Lake	Missouri Coteau		7-Jun	0	0	7.5			No	Yes	
234	Karl Lake	Missouri Coteau		4-Jun	0	0	0.8			Yes	Yes	
151	Lake of the Rivers	Missouri Coteau	72H/12,13	12-Jun	3	7	4.5	fair	low-ave.	Yes	Yes	
258	Little Coteau Lake	Missouri Coteau		8-Jun	0	0	1			Yes	Yes	
263	Lonetree L.	Missouri Coteau	72H/2	4-Jun	0	1	3	fair	ave.	Yes	Yes	
229	MacDonagh Lake	Missouri Coteau		8-Jun	0	0	6.5			Yes	Yes	
231	MacKenzie Lake	Missouri Coteau		8-Jun	0	0	1.5			Yes	Yes	

## 2001 Piping Plover Census

Table 1. Results of 2001 International Piping Plover Breeding Census in Saskatchewan (cont.)

Map #	Site	Region	1:50,000 NTS Map Sheet (s)	2001 census					91 census	96 census	
				Date	No. of pairs	No. of adults	Distance surveyed (km)	Habitat quality			Water level
226	Marjorie Lake	Missouri Coteau		6-Jun	0	0	3.8			Yes	No
247	Mather Lake	Missouri Coteau		nc				poor		Yes	Yes
222	McGrath Lake	Missouri Coteau		11-Jun	0	0	4			Yes	Yes
223	McGrath Lake South	Missouri Coteau		11-Jun	0	0	4.5			Yes	No
280	Montague Lake	Missouri Coteau		13-Jun	0	0	11			Yes	Yes
181	N. of Bliss Lake (UTM 630 155)	Missouri Coteau		8-Jun	0	0	2			Yes	No
274	North Pond (UTM 395 500)	Missouri Coteau		4-Jun	0	0	1.5			Yes	Yes
133	Old Wives L.	Missouri Coteau	72I/4;72J/1	7-Jun	1	5	80.6	fair	ave.	Yes	Yes
177	Oro Lake	Missouri Coteau		6-Jun	0	0	3			Yes	Yes
256	Overland Lake	Missouri Coteau		nc				poor		Yes	Yes
255	Payn Lake	Missouri Coteau		nc				poor		No	Yes
242	Radio Towers (UTM 337 540)	Missouri Coteau		11-Jun	0	0	1.8			Yes	No
240	Radio Towers (UTM 340 538)	Missouri Coteau		11-Jun	0	0	1.8			Yes	No
259	Ratcliffe South	Missouri Coteau		nc				poor		Yes	No
283	Reed L.	Missouri Coteau	72J/6,7	15-Jun	1	3	32.3	poor-fair	ave.	Yes	Yes
215	Ritchie L.	Missouri Coteau	72H/7	5-Jun	0	1	5	poor-fair		Yes	Yes
277	Rivard Lake	Missouri Coteau		6-Jun	0	0	7.5			Yes	Yes
224	Salt L.	Missouri Coteau	72H/7		2	8	11	fair	low	Yes	Yes
286	Salt Lake (UTM 288 035)	Missouri Coteau		16-Jun	0	0	12			Yes	Yes
251	Sandoff L.	Missouri Coteau	72H/1	12-Jun	2	6	8	poor	high	Yes	Yes
162	Scottie Lake (UTM 800 220)	Missouri Coteau		5-Jun	0	0	5			Yes	No
184	Shoe L.	Missouri Coteau	72H/11	4-Jun	3	6	4	poor-fair	low	Yes	Yes
175	Skyeta Lake (UTM 735 197)	Missouri Coteau		5-Jun	0	0	9.5			Yes	No
225	Stiles Lake	Missouri Coteau		n.r.	0	0	3.2			Yes	No



Table 1. Results of 2001 International Piping Plover Breeding Census in Saskatchewan (cont.)

Map #	Site	Region	1:50,000 NTS Map Sheet (s)	2001 census							
				Date	No. of pairs	No. of adults	Distance surveyed (km)	Habitat quality	Water level	91 census	96 census
281	Twelve Mile Lake	Missouri Coteau		15-Jun	0	0	25			Yes	Yes
123	Unnamed, UTM 148 612	Missouri Coteau		nc				poor		Yes	No
125	Unnamed, UTM 180 625	Missouri Coteau		nc				poor		Yes	No
124	Unnamed, UTM 195 630	Missouri Coteau		nc				poor		Yes	No
252	Unnamed, UTM 628 368	Missouri Coteau		nc				poor		No	Yes
213	Unnamed, UTM 847 800	Missouri Coteau		nc				poor		No	Yes
212	Unnamed, UTM 850 814	Missouri Coteau		nc				poor		No	Yes
148	UTM 028 055	Missouri Coteau		6-Jun	0	0	5.5			Yes	Yes
220	UTM 085 495	Missouri Coteau		7-Jun	0	0	2.8			No	Yes
134	UTM 135 405	Missouri Coteau		12-Jun	0	0	2.7			Yes	No
149	UTM 150 065	Missouri Coteau		8-Jun	0	0	6			Yes	No
122	UTM 155 623	Missouri Coteau		12-Jun	0	0	0.4			Yes	No
135	UTM 170 394	Missouri Coteau		11-Jun	0	0	6.5			Yes	No
126	UTM 220 587	Missouri Coteau		12-Jun	0	0	3.6			Yes	No
127	UTM 246 585	Missouri Coteau		12-Jun	0	0	3.3			Yes	No
239	UTM 272 510	Missouri Coteau		11-Jun	0	0	1.6			No	Yes
241	UTM 275 456	Missouri Coteau		7-Jun	0	0	4.8			No	Yes
269	UTM 295 330	Missouri Coteau		7-Jun	0	0	3			No	Yes
137	UTM 295 375	Missouri Coteau		8-Jun	0	0	3			No	Yes
227	UTM 304 706	Missouri Coteau		6-Jun	0	0	3.5			Yes	Yes
265	UTM 310 378	Missouri Coteau		n.r.	0	0	1.5			No	Yes
230	UTM 360 717	Missouri Coteau		8-Jun	0	0	2.2			Yes	Yes
128	UTM 375 604	Missouri Coteau		5-Jun	0	0	1.6			Yes	No
129	UTM 382 645	Missouri Coteau		5-Jun	0	0	0.8			Yes	No
243	UTM 414 530	Missouri Coteau		7-Jun	0	0	1			Yes	Yes
150	UTM 430 164	Missouri Coteau		8-Jun	0	0	0.1			No	Yes
130	UTM 455 552	Missouri Coteau		5-Jun	0	0	4			No	Yes
131	UTM 480 560	Missouri Coteau		5-Jun	0	0	2.4			Yes	No
139	UTM 488 445	Missouri Coteau		6-Jun	0	0	1.8			Yes	No

Table 1. Results of 2001 International Piping Plover Breeding Census in Saskatchewan (cont.)

Map #	Site	Region	1:50,000 NTS Map Sheet (s)	2001 census						91 census	96 census
				Date	No. of pairs	No. of adults	Distance surveyed (km)	Habitat quality	Water level		
284	UTM 493 073	Missouri Coteau		16-Jun	0	0	12			Yes	Yes
140	UTM 500 450	Missouri Coteau		7-Jun	0	0	5			Yes	Yes
233	UTM 503 713	Missouri Coteau		4-Jun	0	0	1.5			Yes	Yes
244	UTM 505 486	Missouri Coteau		12-Jun	0	0	2.5			No	Yes
232	UTM 512 718	Missouri Coteau		4-Jun	0	0	3.5			Yes	Yes
236	UTM 514 656	Missouri Coteau		4-Jun	0	0	0.6			Yes	Yes
132	UTM 534 490	Missouri Coteau		6-Jun	0	0	2.3			Yes	Yes
248	UTM 535 455	Missouri Coteau		12-Jun	0	0	2.5			Yes	Yes
237	UTM 543 575	Missouri Coteau		4-Jun	0	0	0.8			Yes	Yes
249	UTM 550 450	Missouri Coteau		12-Jun	0	0	1.5			Yes	Yes
238	UTM 550 575	Missouri Coteau		4-Jun	0	0	1.6			Yes	Yes
153	UTM 560 273	Missouri Coteau		7-Jun	0	0	2			Yes	Yes
146	UTM 560 404	Missouri Coteau		5-Jun	0	0	1			Yes	No
154	UTM 565 273	Missouri Coteau		7-Jun	0	0	2			Yes	Yes
143	UTM 567 435	Missouri Coteau		5-Jun	0	0	0.3			Yes	No
155	UTM 571 267	Missouri Coteau		8-Jun	0	0	1.5			Yes	No
200	UTM 578 063	Missouri Coteau		7-Jun	0	0	6			Yes	Yes
144	UTM 579 428	Missouri Coteau		5-Jun	0	0	0.4			Yes	No
156	UTM 590 248	Missouri Coteau		7-Jun	0	0	1			No	Yes
250	UTM 591 408	Missouri Coteau		12-Jun	0	0	0.8			No	Yes
199	UTM 632 035	Missouri Coteau		7-Jun	0	0	3			No	Yes
157	UTM 640 309	Missouri Coteau		7-Jun	0	0	1			Yes	No
197	UTM 646 096	Missouri Coteau		7-Jun	0	0	2			Yes	Yes
195	UTM 650 075	Missouri Coteau		4-Jun	0	0	0.8			Yes	Yes
159	UTM 650 295	Missouri Coteau		8-Jun	0	0	1			Yes	Yes
196	UTM 662 075	Missouri Coteau		4-Jun	0	0	0.9			Yes	Yes
160	UTM 673 266	Missouri Coteau		8-Jun	0	0	0.1			Yes	No
193	UTM 684 062	Missouri Coteau		8-Jun	0	0	2.5			Yes	No
192	UTM 691 060	Missouri Coteau		8-Jun	0	0	1.5			Yes	Yes
183	UTM 698 105	Missouri Coteau		8-Jun	0	0	2.5			Yes	Yes

Table 1. Results of 2001 International Piping Plover Breeding Census in Saskatchewan (cont.)

Map # Site	Region	1:50,000 NTS Map Sheet (s)	Date	2001 census					91 census	96 census
				No. of pairs	No. of adults	Distance surveyed (km)	Habitat quality	Water level		
191 UTM 700 080	Missouri Coteau		8-Jun	0	0	1.5			Yes	Yes
189 UTM 714 054	Missouri Coteau		4-Jun	0	0	2			Yes	Yes
187 UTM 717 067	Missouri Coteau		4-Jun	0	0	1.5			Yes	Yes
176 UTM 733 205	Missouri Coteau		5-Jun	0	0	2.5			Yes	No
180 UTM 735 128	Missouri Coteau		7-Jun	0	0	2			Yes	No
172 UTM 737 191	Missouri Coteau		5-Jun	0	0	1.8			Yes	No
188 UTM 738 085	Missouri Coteau		7-Jun	0	0	1			Yes	Yes
186 UTM 739 075	Missouri Coteau		8-Jun	0	0	0.9			Yes	Yes
173 UTM 740 187	Missouri Coteau		5-Jun	0	0	2.2			Yes	No
174 UTM 752 204	Missouri Coteau		5-Jun	0	0	2.3			Yes	No
161 UTM 770 230	Missouri Coteau		5-Jun	0	0	2.3			Yes	No
179 UTM 775 125	Missouri Coteau		7-Jun	0	0	1.5			Yes	Yes
178 UTM 776 116	Missouri Coteau		7-Jun	0	0	1.5			Yes	Yes
170 UTM 831 160	Missouri Coteau		6-Jun	0	0	4			Yes	Yes
201 UTM 832 010	Missouri Coteau		6-Jun	0	0	1.3			Yes	Yes
206 UTM 842 003	Missouri Coteau		6-Jun	0	0	2.2			Yes	Yes
169 UTM 842 162	Missouri Coteau		6-Jun	0	0	2.4			Yes	Yes
168 UTM 845 167	Missouri Coteau		6-Jun	0	0	0.6			No	Yes
166 UTM 848 171	Missouri Coteau		6-Jun	0	0	1			No	Yes
167 UTM 849 167	Missouri Coteau		6-Jun	0	0	1			No	Yes
207 UTM 851 988	Missouri Coteau		6-Jun	0	0	1.2			No	Yes
163 UTM 857 197	Missouri Coteau		6-Jun	0	0	2			No	Yes
164 UTM 863 200	Missouri Coteau		6-Jun	0	0	1.2			Yes	Yes
165 UTM 915 261	Missouri Coteau		6-Jun	0	0	1.3			No	Yes
147 UTM 995 088	Missouri Coteau		6-Jun	0	0	3			Yes	Yes
246 Wellington Lake	Missouri Coteau		nc				poor		Yes	Yes
262 West Coteau Lake (UTM 350 315)	Missouri Coteau		8-Jun	0	0	12			Yes	Yes

Table 1. Results of 2001 International Piping Plover Breeding Census in Saskatchewan (cont.)

Map #	Site	Region	1:50,000 NTS Map Sheet (s)	2001 census							91 census	96 census
				Date	No. of pairs	No. of adults	Distance surveyed (km)	Habitat quality	Water level			
279	Willowbunch L.	Missouri Coteau	72H/5,6	6-Jun	15	41	110	poor	low	Yes	Yes	
53	Blaine Lake North	North Central		4-Jun	0	0	6.5			Yes	Yes	
4	Green Lake	North Central		6-Jun	0	0	0.4			Yes	Yes	
50	Lizard Lake	North Central		6-Jun	0	0	7			Yes	Yes	
54	Marion Lake	North Central		3-Jun	0	0	3.2			Yes	Yes	
51	Radisson Lake	North Central		7-Jun	0	0	7			Yes	Yes	
52	Redberry L.	North Central	73B/11	4-Jun	1	7	16.5	fair-good	low-ave.	Yes	Yes	
55	Rempel Lake	North Central		3-Jun	0	0	1.6			Yes	Yes	
45	Van Scoy Lake	North Central		6-Jun	0	0	8			Yes	Yes	
65	Arthur Lake	Northeast		12-Jun	0	0	3.5			No	Yes	
60	Basin Lake	Northeast		14-Jun	0	0	25			Yes	Yes	
59	Bruno Lake	Northeast		13-Jun	0	0	4			No	Yes	
74	Buffer Lake	Northeast		10-Jun	0	0	23			Yes	Yes	
78	East of Perigord (UTM 990 006)	Northeast		9-Jun	0	0	1			Yes	Yes	
61	Elkona L.	Northeast	73A/11	8-Jun	0	2	5	fair	low	Yes	Yes	
75	Houghton Lake	Northeast		8-Jun	0	0	30			Yes	Yes	
57	Jumping Lake (Big)	Northeast		5-Jun	0	0	15			Yes	Yes	
56	Jumping Lake (Small)	Northeast		5-Jun	0	0	5			Yes	Yes	
77	Lake Charron	Northeast		8-Jun	0	0	5			Yes	Yes	
76	Lenore L.	Northeast	73A/10,6,7,11	9-Jun	0	3	56	fair	low	Yes	Yes	
70	Louis Lake	Northeast		8-Jun	0	0	5.5			No	Yes	
71	Lucien Lake	Northeast		14-Jun	0	0	4			No	Yes	
67	Marie Lake	Northeast		11-Jun	0	0	2			Yes	Yes	
63	McIntyre Lake	Northeast		8-Jun	0	0	7			No	Yes	
62	Middle Lake	Northeast		7-Jun	0	0	15			Yes	Yes	
73	Muskiki Lake	Northeast		5-Jun	0	0	26			Yes	Yes	
66	Olivier Lake	Northeast		12-Jun	0	0	2.5			Yes	Yes	
6	Sandy Beach, Amisk Lake	Northeast		n.r.	0	0	1			No	Yes	

Table 1. Results of 2001 International Piping Plover Breeding Census in Saskatchewan (cont.)

Map #	Site	Region	1:50,000 NTS Map Sheet (s)	2001 census							91 census	96 census
				Date	No. of pairs	No. of adults	Distance surveyed (km)	Habitat quality	Water level			
64	Sayer Lake	Northeast	62M/14	8-Jun	0	0	5.8	poor	ave.	No	Yes	
58	Shannon Lake	Northeast		13-Jun	0	0	10			No	Yes	
105	Stonewall L.	Northeast		8-Jun	0	1	8.6			Yes	Yes	
69	Unnamed, UTM 710 160	Northeast		nc						No	Yes	
72	UTM 665 130	Northeast	73C/7	12-Jun	0	0	2.5	good	low-ave.	Yes	Yes	
68	UTM 670 165	Northeast		12-Jun	0	0	1.5			No	Yes	
47	Aroma L.	Northwest		7-Jun	1	7	3.5			Yes	Yes	
8	Belliveau Lake	Northwest		13-Jun	0	0	2			No	No	
43	Castlewood Lake	Northwest	73C/12	9-Jun	0	0	9	fair	low	Yes	Yes	
5	Chisholm Lake	Northwest		15-Jun	0	0	2			No	Yes	
31	Ear Lake	Northwest		4-Jun	0	0	4			Yes	Yes	
18	East Reflex Lake	Northwest		7-Jun	0	0	12			Yes	Yes	
20	Freshwater L. North	Northwest	73C/12		1	3	4.8	fair		No	Yes	
21	Freshwater L. South	Northwest	73C/12	4-Jun	0	3	9.4			No	Yes	
25	Houchen Lake	Northwest	5-Jun	0	0	3	No			No		
27	Jay Lake	Northwest	nc				Yes			Yes		
48	Jones Lake (SW of Keppel Lake)	Northwest	73C/6	11-Jun	0	0	2	fair	low-ave.	No	No	
49	Keppel Lake	Northwest		11-Jun	0	0	20					
26	Killsquaw Lakes	Northwest		8-Jun	1	3	11			Yes	Yes	
3	Lac des Isles	Northwest		14-Jun	0	0	6			Yes	Yes	
2	Lac Ile-a-la Crosse (South Bay)	Northwest	73C/12	15-Jun	0	0	0.8	fair		Yes	Yes	
37	Lake North of Handel	Northwest		8-Jun	0	0	2			Yes	Yes	
13	Lambert Lake	Northwest		17-Jun	0	0	4.8			Yes	Yes	
38	Landis Lake	Northwest		8-Jun	0	0	0.1			Yes	Yes	
22	Little Manitou Lake	Northwest	73C/12	15-Jun	1	3	20	fair		No	No	
36	Little Tramping Lake	Northwest	8-Jun	0	0	1	No			Yes		
41	Lydden Lake	Northwest	9-Jun	0	0	17	Yes			Yes		
16	Manitou L.	Northwest	73C/13,12	9-Jun	7	18	65			Yes	Yes	
42	Oban Lake	Northwest	73C/13,12	10-Jun	0	0	4	fair		Yes	Yes	
1	Peter Pond Lake/Sandy Point	Northwest		15-Jun	0	0	2.5			Yes	Yes	

## 2001 Piping Plover Census

Table 1. Results of 2001 International Piping Plover Breeding Census in Saskatchewan (cont.)

Map #	Site	Region	1:50,000 NTS Map Sheet (s)	2001 census							91 census	96 census
				Date	No. of pairs	No. of adults	Distance surveyed (km)	Habitat quality	Water level			
12	Picnic Lake	Northwest	73C/12	12-Jun	0	0	3	good	low	No	No	
7	Ray's Lake	Northwest		13-Jun	0	0	2			No	No	
28	Reed Lake NW	Northwest		4-Jun	0	0	0.5			Yes	Yes	
11	Russell Lake	Northwest		12-Jun	0	0	11			Yes	Yes	
17	Schopfer Slough	Northwest		8-Jun	0	1	5.3			No	Yes	
39	SE of Landis Lake (UTM 722 817)	Northwest	73C/11	8-Jun	0	0	1	fair	low	Yes	Yes	
24	Seagram L. West	Northwest		3-Jun	0	2	10.1			Yes	Yes	
23	Seagram Lake East	Northwest		12-Jun	0	0	8			No	Yes	
10	Stony Lake	Northwest		15-Jun	0	0	12			Yes	Yes	
14	Sunny Lake	Northwest		15-Jun	0	0	4			No	Yes	
35	Tramping Lake	Northwest	73C/13	8-Jun	0	0	6.5			Yes	Yes	
9	W. of Spruce Lake (UTM 262 344)	Northwest		13-Jun	0	0	2.3			No	No	
15	Wells L.	Northwest		13-Jun	0	2	10.5			low	No	Yes
40	West of Whiteshore Lake	Northwest		8-Jun	0	0	2				Yes	Yes
19	West Reflex L., SK portion	Northwest		7-Jun	6	18	5			poor-fair	low	Yes
29	Winterhaldt Lake	Northwest	Regina Plains	15-Jun	0	0	3.5			No	Yes	
30	Zoller Lake	Northwest		15-Jun	0	0	2.5			No	Yes	
116	Crescent Lake	Regina Plains		18-Jun	0	0	10			Yes	Yes	
112	Good Spirit Lake	Regina Plains		18-Jun	0	0	8			Yes	Yes	
113	Horseshoe Lake	Regina Plains		20-Jun	0	0	0.5			Yes	Yes	
121	Ibsen Lake	Regina Plains		8-Jun	0	0	2			Yes	Yes	
117	Kipling Marsh	Regina Plains		9-Jun	0	0	18			No	Yes	
115	Leech Lake	Regina Plains		18-Jun	0	0	12			Yes	Yes	
118	Moose Mountain Lake	Regina Plains		3-Jun	0	0	21				Yes	Yes
120	Nickle Lake	Regina Plains		5-Jun	0	0	3				Yes	Yes
119	Rock Lake	Regina Plains	11-Jun	0	0	2		Yes	Yes			

## 2001 Piping Plover Census

Table 1. Results of 2001 International Piping Plover Breeding Census in Saskatchewan (cont.)

Map #	Site	Region	1:50,000 NTS Map Sheet (s)	Date	2001 census					91 census	96 census
					No. of pairs	No. of adults	Distance surveyed (km)	Habitat quality	Water level		
114	Soda Lake	Regina Plains		18-Jun	0	0	3.7			Yes	Yes
299	L. Diefenbaker (Riverhurst-Arms)	S. Saskatchewan R.	72O/2,1,7;72J/15,16	3-Jun	57	189	197.4	good	n/a	Yes	Yes
287	L. Diefenbaker (Sk Landing-Riverhurst)	S. Saskatchewan R.	72J/11,12,14,15	12-Jun	6	12	120			Yes	No
300	Middle South Sask. River	S. Saskatchewan R.	72O/7,6,11,10,15;73B/2	7-Jun	1	7	y	fair	low	Yes	Yes
296	S. Saskatchewan R., upstream	S. Saskatchewan R.		5-Jun	0	0	71			Yes	Yes
84	Bradwell Reservoir	Saskatoon SE		12-Jun	0	0	1			Yes	Yes
80	Burke Lake	Saskatoon SE		7-Jun	0	0	9.7			Yes	Yes
83	Esker Slough (UTM 124 657)	Saskatoon SE		12-Jun	0	0	2			Yes	Yes
85	Meacham East	Saskatoon SE		10-Jun	0	0	16.1			Yes	Yes
87	Meacham SE (UTM 603 647)	Saskatoon SE		7-Jun	0	0	19.4			Yes	Yes
86	Meacham South	Saskatoon SE	73A/4	8-Jun	0	1	9.7	poor	low	Yes	Yes
82	NW of Blucher (UTM 155 642)	Saskatoon SE		12-Jun	0	0	3			Yes	Yes
81	Patience Lake	Saskatoon SE		12-Jun	0	0	10			Yes	Yes
79	Porter Lake	Saskatoon SE		7-Jun	0	0	8.5			Yes	Yes
294	Driscoll Lake	Southwest		11-Jun	0	0	6.5			Yes	Yes
290	Freefight L.	Southwest	72K/6	12-Jun	3	7	5	good	low-ave.	Yes	Yes
291	Ingebrigt Lake	Southwest		8-Jun	0	0	10			Yes	Yes
295	Lonetree Lake	Southwest		9-Jun	0	0	11			Yes	Yes
292	MacLaren Lake	Southwest		6-Jun	0	0	4.8			Yes	Yes
293	Notukeu Lake	Southwest		14-Jun	0	0	7.5			Yes	Yes
289	Snakehole Lake	Southwest		3-Jun	0	0	0.2			Yes	Yes
288	Success Lake	Southwest		6-Jun	0	0	0.5			No	Yes
136	UTM 277 363	Southwest		8-Jun	0	0	0.1			No	Yes



Table 1. Results of 2001 International Piping Plover Breeding Census in Saskatchewan (cont.)

Map #	Site	Region	1:50,000 NTS Map Sheet (s)	2001 census					91 census	96 census	
				Date	No. of pairs	No. of adults	Distance surveyed (km)	Habitat quality			Water level
297	Alsask Reservoir	West	72O/3	7-Jun	0	0	8.2			Yes	Yes
298	Luck Lake	West		2-Jun	0	2	20	fair	ave.	No	No
34	Opuntia Lake	West		nc				poor		Yes	Yes
32	Plover Lake	West		nc				poor		Yes	Yes
46	Stockwell Lake	West		10-Jun	0	0	4.8			Yes	Yes
44	Valley Centre (UTM 025 454)	West		5-Jun	0	0	4			Yes	Yes
33	Zella Lake	West		nc				poor		Yes	Yes
				Totals	212	805	2421.2				

nc= no census

## The 2001 Piping Plover Census in Alberta

David R. C. Prescott

*Alberta Sustainable Resource Development, Southeast Region, Suite 404, First Red Deer Place, 4911 - 51st Street, Red Deer, AB T4N 6V4*

### Abstract

Fewer Piping Plovers (*Charadrius melodus circumcinctus*) were counted during the 2001 census than in previous years despite increased survey effort. A total of 60 pairs and 30 single birds (150 individuals) were found on 23 lakes in the province during 2001. This represents a provincial decline of 48% since 1986, 17% since 1991, and 46% since 1996. The lower populations present during 2001 may be partly attributed to low water levels. It is also possible that birds have redistributed to other parts of their breeding range where habitat conditions are more favourable.

This report summarizes information on populations and habitats gathered during the 2001 census, and compares results to the two previous international censuses and a relatively complete survey conducted in 1986 by Wershler and Wallis (1987).

### Résumé

Malgré un programme de recensement plus complet, les recenseurs ont dénombré moins d'oiseaux en 2001 que lors des années précédentes. Au total, 60 couples et 30 oiseaux sans partenaire (150 individus) ont été repérés au bord de 23 lacs. Il s'agit d'une baisse de 47,9 % depuis 1986, de 16,7 % depuis 1991 et de 45,7 % depuis 1996. Ces chiffres peuvent être attribués en partie à la baisse des niveaux d'eau engendrée par trois années de précipitations inférieures à la moyenne dans le Sud et le Centre de l'Alberta. Il est également possible que les oiseaux se soient disséminés dans d'autres parties de leur aire de nidification où les conditions sont plus favorables.

Ce rapport résume les données recueillies sur les populations et les habitats du Pluvier siffleur au cours du recensement de 2001. Il compare également les résultats obtenus à ceux des deux recensements internationaux précédents et d'un recensement relativement complet réalisé en 1986 par Wershler et Wallis (1987).

### Introduction

Piping Plover (*Charadrius melodus circumcinctus*) populations have declined throughout their North American breeding range in recent decades, and the species is listed as "endangered" or "threatened" in most federal, state, and provincial jurisdictions (Goossen *et al.* 2002). The "endangered" designation was assigned in Alberta in 1987 and reaffirmed in 2000 (Prescott 1997; unpubl. Ministerial Order).

The number of breeding birds counted in Alberta increased from 180 to 276 individuals between the 1991 and 1996 surveys, although this increase was at least partly attributable to a large increase in the number of lakes surveyed (48 to 103; Hofman 1994; Bjorge 1997).

This report documents the 2001 census in Alberta, and compares the results to the two previous international censuses and a relatively complete provincial survey of Piping Plovers in Alberta conducted in 1986 by Wershler and Wallis (1987). Together, these surveys provide a profile of Piping Plover population trends and breeding distribution in Alberta over the past 15 years.

## Methods

Aerial reconnaissance of a broad area of central Alberta (the core of the provincial breeding range) was conducted in May 2001 (Prescott 2001). This survey identified 22 previously unsurveyed basins that appeared to have high or medium potential for Piping Plovers, and 11 previously surveyed basins that contained no apparent breeding habitat and were assumed to be unpopulated for temporal comparison of populations. The unsuitable lakes (Bunder, Floatingstone, Joseph, Brosseau, St. Cur, Eliza, Lonepine, Majors, Olivers, Sounding, and Wilkins) were not incorporated in the survey. A total of 116 lakes were selected for ground surveys in 2001.

The survey was coordinated by Alberta Fish and Wildlife Division in the Parkland Region. The coordinator prepared information packages for each lake, including a census form and instructions provided by the International Piping Plover Coordinating Group, a map of the lake, and a form to document individual habitats and associated threats (if any) on each lake surveyed. The coordinator then assigned staff or volunteers to survey specific lakes. Whenever possible, lakes were surveyed by the same observer(s) who conducted previous surveys. Participants unfamiliar with field identification of Piping Plovers or their habitats were paired with more experienced observers, or were invited to observe the birds on lakes known to be occupied before conducting surveys on their assigned lakes.

Methodology for the field survey was established by the International Piping Plover Coordinating Group, and was little changed from previous surveys (see Plissner and Haig 1997). In brief, observers throughout North America walked shorelines of all lakes while counting single or paired Piping Plovers, and were asked to record information such as weather conditions, types of habitats surveyed and occupied, distance traveled, and percentage of shoreline not surveyed. Observers in Alberta were also asked to collect supplementary data considered important for the management of Piping Plovers in this province. This information included identifying discrete stretches of shoreline on each lake that contained (in their opinion) either primary, secondary, or tertiary habitat, specific threats to these shorelines, and the presence of California (*Larus californicus*) or Ring-billed Gull (*L. delawarensis*) colonies, as these birds are known predators of Piping Plover nests and chicks (Whyte 1985). Observers were advised not to spend time looking for nests, but were asked to inspect all birds for the presence of color bands. The survey period throughout North America was 3- 16 June 2001.

## Results

A total of 115 lakes were surveyed during the 2001 census (Table 1). Only two lakes surveyed in either 1991 or 1996 could not be visited in 2001: Lesser Slave Lake and Neutral Hills C2 (also missed in 1996). One new lake selected for survey (Island Lake) was not checked in 2001. Two lakes were opportunistically added to the survey (Chain Lake #2 and Sittingstone Lake). At least 107 lakes (93% of total) were surveyed during the recommended survey period of 3 to 16 June (survey date was not reported for one lake). The earliest surveys were conducted on 1 June (two lakes), with all but one survey completed by 21 June. Long Lake, in the Parkland Region, was surveyed well outside the recommended survey window (1 July; Table 1).

A total of 55 observers participated in the surveys and they contributed an estimated 586 person-hours of survey effort. These observers covered at least 918 km of shoreline by foot, boat or all-terrain vehicle (Table 1). These values are minimum estimates, as person-hours and distance surveyed were not recorded for one and two lakes, respectively. Furthermore, time and distance were sometimes recorded as "0" when a lake was visited and habitat was immediately assessed to be unsuitable and unpopulated by Piping Plovers. The percentage of habitat not surveyed on particular lakes varied from 0 to 95% (mean=11%, n=110 lakes). However, these values are inaccurate, as some observers based estimates on total shoreline, whereas others based estimates on the length of suitable habitat. Therefore, the

percentage of total shoreline missed on surveyed lakes was certainly higher than 11 %, but the percentage of suitable habitat missed was much less (likely <5%).

The overall level of effort was substantially higher in 2001 than in previous years. In 1996 a total of 59 participants surveyed 752 km of shoreline on 103 lakes and in 1991, 17 participants surveyed 167 km of shoreline on 48 lakes (Bjorge 1997; Hofman 1994).

A total of 150 birds comprising 60 pairs and 30 singles were found on 23 lakes during the 2001 census (Table 1). Three sites contained 42% of the provincial total, with counts of 31 birds at West Reflex Lake, 19 at Muriel Lake and 13 at Plain Lake. The importance of Reflex Lake for Piping Plovers is further highlighted by an additional 18 birds being counted on the Saskatchewan side of the lake. Only two lakes besides West Reflex had more than nine birds, and these were Muriel Lake that had 19 individuals and Plain Lake that had 13 individuals. In addition to Plain Lake, three previously unsurveyed lakes were found to support Piping Plovers: Hansman Lake (6), an unnamed lake SE of Capt. Eyre Lake (5), and Frog Lake (3). The Parkland Region supported 61% of the provincial population of Piping Plovers, comprising 91 Piping Plovers distributed on 13 lakes. The Bow Region supported 23% of the provincial total or 35 Piping Plovers, on 7 lakes. The Northeast Boreal Region had 15% of the provincial population or 22 adults on two lakes. Only one lake in the Prairie Region, the St. Mary Reservoir, supported Piping Plovers. This site had two birds or 1% of the provincial population.

The number of Piping Plovers counted in 2001 represent a decline of 48% from a 1986 count of 288 individuals on 28 lakes counted in 1986; a decline of 17% from 180 birds on 26 lakes in 1991, and 46% from 276 birds on 31 lakes in 1996 (Wershler and Wallis 1987; Hofman 1994; Bjorge 1997). Of 59 lakes surveyed in both 1986 and 2001 (including lakes presumed to be unpopulated from knowledge of habitat conditions), 27 had fewer Piping Plovers, 24 were unchanged (all were 0 in both years) and 8 increased. Lakes with increasing populations were: Baxter, Hansman, Killarney, Leane, Plover, Red Deer and Sunken. Of the 44 lakes that were surveyed in both 1991 and 2001; 21 had fewer birds, 20 remained the same (18 were 0 in both years), and three increased (Baxter, Chain #1 and West Reflex lakes). A comparison between 1996 and 2001 population levels (103 lakes) shows that 25 decreased, 68 remained the same (all were 0 in both years) and 10 increased (Albert, Baxter, Foster, Leane, Little Fish, Muriel, Plover, Red Deer, and West Reflex lakes; Table 2).

There were 38 lakes surveyed in all five-year intervals since 1986 (including lakes presumed to be unpopulated in either 1986 or 2001). Populations on these lakes in 2001 (74 birds) have declined 74 % since 1986 (281+ birds) (Figure 2). There are six lakes (Chain #4, Dowling, Handhills, Piper, Sunken and West Reflex) that have supported Piping Plovers in all years, whereas eight (Chain #3A and 7, Gillespie, Lonepine, Lowden, McDonald, Miquelon #2, and Neutral Hills B2) have never supported any birds. There are 19 lakes that had birds in 1986 and that are now unpopulated, and only four lakes that were unpopulated in 1986 have supported birds on any subsequent survey (Baxter, Chain #1, Leane and Killarney). Only West Reflex Lake has maintained substantial populations (range of 12 in 1991 to 46+ in 1986) over all four surveys (Table 2).

A total of 14 color-banded birds were observed on six Alberta lakes during the 2001 census (Table 3). There were five banded adults (three on West Reflex, two on Handhills) on the same lakes earlier in the season. One bird on Akasu Lake was banded as a chick on Chain Lake #4 in 1999, and one bird on West Reflex Lake was a chick banded on Sunken Lake in 1999. The origin of six birds (2 on Plain, 1 on Albert, 3 on West Reflex) could not be determined, as one or more color bands were missing. However, four of these birds were banded on one of five lakes in Alberta in 1998. An adult sighted on Chain #4 had a similar colour band scheme of birds banded during the late 1990s in Texas.

Assessment of water level change was provided for 40 lakes, with 31 (77%) lakes lower, four (10%) higher, and five (12%) similar (Table 1) to levels in 1996. Observers reported 20 lakes to be dry (Table 1), and numerous others at very low levels. Four dry lakes supported birds in 2001 (Chain #1 and #4, Dowling and Killarney).

Potential threats to nesting beaches were identified for 86 lakes, and for 365 separate stretches of habitat on these lakes. On lakes, or habitats within lakes where no threats were reported, there was the possibility that threats existed but just not indicated. Nevertheless, the available reports likely represent a reasonable cross-section of impacts on Piping Plover habitat in Alberta.

Cattle grazing were the greatest potential threat to Piping Plovers lakes (Table 4). Grazing was also the most frequently observed threat to individual beaches. Vegetation encroachment, a result of declining water levels, was the second most prevalent impact on Piping Plover habitat. Motorized vehicles and recreational/ residential use were also prominent threats on lakes, but much less so on individual beaches. Water management activities and petroleum extraction/ exploration were relatively minor threats to most lakes and habitats (Table 4). The presence/absence of Ring-billed or California Gull colonies was noted on 100 lakes, with 17 (17%) having active colonies. Piping Plovers occupied five of these lakes in 2001 (Akasu, Little Fish, Frog and Muriel lakes, and St. Mary Reservoir).

### Discussion

There have been four major surveys of Piping Plovers in Alberta during the past 15 years. Annual research and population monitoring at key breeding areas in the province have also been conducted during the past decade (Hofman 1993; Heckbert 1994; Heckbert and Cantelon 1996; Richardson 1999; Michaud and Prescott 1999; Engley and Michaud 2000). These initiatives have steadily increased our understanding of the distribution of Piping Plovers and their habitat in Alberta, and resulted in an increasingly skilled group of observers. Consequently, the 2001 survey achieved the most complete and comprehensive count of Piping Plovers ever conducted in the province. Despite this effort, the population of Piping Plovers in Alberta is at the lowest level ever recorded. The count of 150 individuals in 2001 is nearly a 50% reduction from overall populations found in 1986 and 1996. Had the survey effort expended in 2001 been consistent with previous years, the decline would undoubtedly have been much more dramatic.

The reasons for declining populations in Alberta are not clear. In 2001, central and southern Alberta was in its third year of below-average precipitation. As a result, over 75% of Piping Plover lakes reported lower water levels in 2001 compared to 1996, and 20 of those surveyed were dry. Although receding water levels are necessary to expose Piping Plover habitat (Prescott 1997), prolonged low water levels cause beaches to become vegetated and unsuitable for nesting. While vegetation encroachment can result in habitat loss for breeding Piping Plovers, the percentage of occupied lakes impacted by vegetation encroachment was lower in 2001 (52%) than it was in 1996 (74%; Bjorge and Murphy 2004). Furthermore, almost half of all lakes with primary habitat, and almost three-quarters of all beaches of primary quality, were unoccupied in 2001. This strongly suggests that much suitable habitat was unoccupied in the province in 2001, and that provincial declines in population size cannot be explained by recent deterioration of habitat quality. Given that the availability of Piping Plover habitat varies from year to year across the species' range, it is also possible that birds that normally breed in Alberta nested elsewhere in 2001. Results from the 2001 International Census suggest that populations are well below 1996 levels across the Canadian prairies and much of the Northern Great Plains, but substantially higher along the Missouri River (Ferland and Haig 2002). Population declines on the Canadian prairies could therefore reflect a short-term redistribution of birds to areas further south. However, the number of birds on the Missouri River does not compensate for the declines in Alberta (Ferland and Haig 2002).

As in all previous surveys, the 2001 total of 150 birds is likely an underestimate. There undoubtedly remain a number of lakes in the province that have not yet been surveyed, and which could support populations of breeding birds. For example, incidental observations of Piping Plovers were reported from two lakes not included in the 2001 census: Stirling Lake (south of Lethbridge) on 21 May, and Whitford Lake (northeast of Lamont) on 15 June (Horch 2001; R. Hughes pers. comm.). Furthermore single birds were reported from Gull Lake on 12 or 13 May, and from Beaverhill Lake on



24 May (J. Rogers pers. Comm.; D. Dekker pers. comm.). These lakes were included in the 2001 survey, but no birds were found during the official census period. It is possible that most or all of these birds were transients, but breeding at some sites cannot be completely ruled out. Total numbers were also likely to be underestimated because observers were specifically discouraged from searching for nests. Thus, many of the 30 single birds encountered during the survey could have been members of a breeding pair, which would substantially increase the calculated provincial populations. However, given the standardized methodology used on all international censuses, it is unlikely that the precision of the 2001 population estimate differed from previous years.

The Piping Plover has recently been established as an endangered species by the province of Alberta, and a recovery team and detailed management plan will be assembled by early 2002. The 2001 survey therefore provides wildlife managers with important and contemporary information on distribution of birds and habitat, and anthropogenic threats that must be managed if sustainable populations are to persist in Alberta. A key element of management efforts will be ongoing surveys in the province. These surveys are critical for monitoring population trends, tracking habitat suitability, and determining the success of management initiatives.

### Acknowledgements

The success of the 2001 International Piping Plover Census in Alberta was achieved through the cooperation, dedication, and contributions of a large number of staff, volunteers and organizations. The surveyors were: J. Allen, M. Barr, M. Besko, D. Birn, R. Bjorge, B. Boukall, M. Cardinal, R. Chabaylo, G. Clements, D. Cole, B. Downey, L. Engley, G. Erickson, S. Feser, J. Folinabee, C. Found, K. Froggatt, M. Gingras, S. Greene, W. Hall, E. Hofman, A. Hubbs, G. Hvengaard, K. Kendell, F. Kunnas, G. McClelland, I. Michaud, T. Morgan, D. Moore, A. Murphy, J. Nicholson, G. Nieman, M. Pearce, R. Pellerin, S. Peters, M. Piorecky, J. Potter, D. Prescott, R. Quinlan, M. Ranger, B. Rippin, C. Rowan, K. Rowsell, R. Russell, T. Sadler, R. Schmelzeisen, T. Sellin, J. Shier, D. Spencer, A. Todd, Z. Waldner, C. Wallman, M. Wells, J. Young, and P. Young. I also thank B. Boukall and M. Piorecky for administrative assistance, and M. Piorecky and R. Bjorge for reviewing a draft of the report.

The project was supported with funding from the Species at Risk Program of Alberta Sustainable Resource Development.

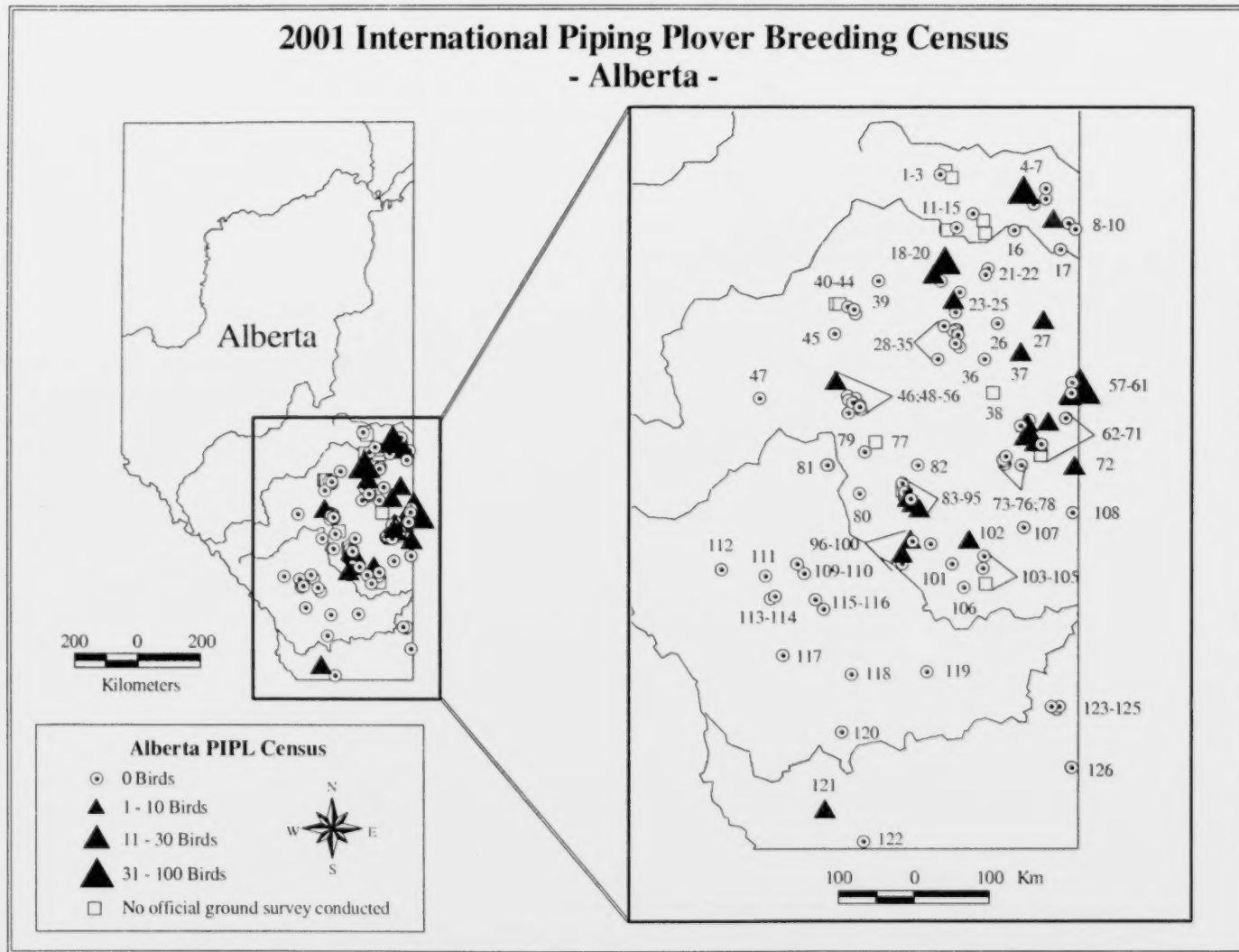


Figure 1. Distribution of Piping Plover in Alberta during 2001 census.



## 2001 Piping Plover Census

Table 1. Results of 2001 International Piping Plover Breeding Census in Alberta

Map #	Site	Region	1:50,000 NTS Map Sheet(s)	Date	2001 census				Water level <sup>b</sup>	91 census	96 census
					No. of pairs	No. of adults	Person hours	Distance surveyed (km)			
100	Antelope Lakes	Bow	82P/8	06 June	0	0	2.4	3.2		No	Yes
106	Bartman Reservoir	Bow	72M/3	12 June	0	0	1.75	5.6		No	No
101	Berry Creek Reservoir	Bow	72M/5	12, 13, 14 June	0	0	4	17.6		No	No
104	Blood Indian Creek Reservoir	Bow	72M/3,6	07 June	0	0	1.25	12.8	L	No	No
95	Chain Lake 1 (Pearl L.)	Bow	82P/16	12 June	2	4	3	5	(d)	Yes	Yes
86	Chain Lake 2	Bow	82P/16	12 June	0	0	0	0	(d)	No	No
89	Chain Lake 3 (Clear L.)	Bow	82P/16	12 June	0	0	0.5	3	(d)	Yes	Yes
87	Chain Lake 3A	Bow	82P/16	12 June	0	0	0.5	3.2	(d)	Yes	Yes
88	Chain Lake 4	Bow	82P/16	12 June	2	5	7	8	(d)	Yes	Yes
90	Chain Lake 5	Bow	82P/16	12 June	0	0	0	0	(d)	No	Yes
91	Chain Lake 6	Bow	82P/16	12 June	0	0	0	0	(d)	Yes	Yes
85	Chain Lake 7	Bow	82P/16	12 June	0	0	0	0	(d)	Yes	Yes
113	Chestermere Lake	Bow	82P/4	13 June	0	0	2	1.6	S	No	Yes
112	Cochrane Lake	Bow	82O/1,8	14 June	0	0	4.5	4		No	Yes
98	Coleman Lake	Bow	72M/5	07, 08 June	0	0	11	15		No	No
93	Dowling Lake	Bow	72M/12,13; 82P/9,16	12 June	1	4	14	11	L (d)	Yes	Yes
108	Dragon Lake	Bow	72M/9	06 June	0	0	4			No	No
115	Eagle Lake	Bow	82P/3; 82I/14	14 June	0	0	1	1	L	No	Yes
68	Foster Lake	Bow	73D/2	14 June	1	4	10.5	7.2	L	No	Yes
117	Frank Lake	Bow	82I/12	11 June	0	0	2.5	5	S	No	Yes
78	Gooseberry Lake	Bow	73D/2	05 June	0	0	3.5	9		Yes	Yes
70	Greenlee Lake	Bow	73D/1,2	21 June	0	0	1.5	3.5		Yes	Yes
96	Handhills Lake	Bow	82P/8,9	13 June	4	9	9	12		Yes	Yes
114	Janet Lake	Bow	82P/4	08 June	0	0	1.6	0.75	L	No	Yes
119	Lake Newell	Bow	72L/5	14 June	0	0	20.25	36.8		Yes	Yes
99	Little Fish Lake	Bow	82P/8	13 June	1	3	7	10		Yes	Yes
110	Long Lake (Wheatland)	Bow	82P/3	13 June	0	0	1	1.6	L (d)	No	Yes

Table 1. Results of 2001 International Piping Plover Breeding Census in Alberta (cont.)

Map #	Site	Region	1:50,000 NTS Map Sheet(s)	Date	2001 census			Distance surveyed (km)	Water level <sup>b</sup>	91 census	96 census
					No. of pairs	No. of adults	Person hours				
111	McDonald Lake	Bow	82P/4	07 June	0	0	5.9	4	S	Yes	Yes
84	Mudspring Lake	Bow	82P/15	07 June	0	0	2	2	(d)	No	Yes
116	Namaka Lake	Bow	82I/14	14 June	0	0	1	3	L	No	Yes
76	Neutral Hills A	Bow	73D/2	15 June	0	0	2	1.6	(d)	Yes	Yes
75	Neutral Hills B1	Bow	73D/2	15 June	0	0	3.17	4.8		Yes	Yes
74	Neutral Hills B2	Bow	73D/2	15 June	0	0	1.33	4		Yes	Yes
73	Neutral Hills C1	Bow	73D/2	15 June	0	0	4.25	2.4	L	Yes	Yes
102	Plover Lake	Bow	72M/6	08, 13 June	2	6	5.25	16		No	Yes
109	Salt Lake Reservoir	Bow	82P/5	14 June	0	0	2	1	L	No	Yes
107	Sounding Creek Reservoir	Bow	72M/10	07 June	0	0	2	5		No	No
97	Unnamed (0.5 km S of Handhills L.)	Bow	82P/8	13 June	0	0	1	2	(d)	No	No
103	Unnamed (8km N Blood Indian Cr. Res.)	Bow	72M/6	07 June	0	0	3.5	4.8	L	No	No
94	Unnamed (btwn Chain 1 and Dowling L.)	Bow	82P/16	12 June	0	0	3	1.5	(d)	No	No
6	Cushing Lake	Northeast Boreal	82L/1	11 June	0	0	6	5		No	No
8	Frog Lake	Northeast Boreal	73E/16	20 June	1	3	55	46		No	No
7	Garnier Lakes	Northeast Boreal	73L/2; 73E/15	21 June	0	0	8.75	8		No	Yes
14	Lac Sante	Northeast Boreal	73E/13	11 June	0	0	6	14		No	No
11	Lower Therien Lake	Northeast Boreal	73E/4	07 June	0	0	7	5	L	No	Yes
4	Muriel Lake	Northeast Boreal	73L/2	06, 07 June	9	19	11	10	L	No	Yes
1	Reed Lake	Northeast Boreal	73L/5	21 June	0	0	3.15	3		No	Yes
5	Reita Lake	Northeast Boreal	82L/1	11, 14 June	0	0	16.5	8		No	No
10	Wasagamu Lake	Northeast Boreal	73E/16		0	0				No	
19	Akasu Lake	Parkland	73E/5	01 June	0	2	6	5	L	No	Yes
27	Albert Lake	Parkland	73E/1	06 June	3	6	1.25	7	L	No	Yes

## 2001 Piping Plover Census

Table 1. Results of 2001 International Piping Plover Breeding Census in Alberta (cont.)

Map #	Site	Region	1:50,000 NTS Map Sheet(s)	Date	2001 census						91 census	96 census
					No. of pairs	No. of adults	Person hours	Distance surveyed (km)	Water level <sup>b</sup>			
25	Alice Lake	Parkland	73E/4,5	05 June	0	0	3	9.5	H	No	Yes	
37	Baxter Lake	Parkland	73D/15	05 June	2	6	4.25	8	L	Yes	Yes	
39	Beaverhill Lake	Parkland	83H/7,8,9,10	11 June	0	0	10	15	L	No	Yes	
24	Birch Lake (Main basin)	Parkland	73E/5	05 June	3	7	12	16		No	Yes	
23	Birch Lake (N basin)	Parkland	73E/5	01 June	0	0	4	6	L	No	Yes	
45	Bittern Lake	Parkland	83 H/3	09 June	0	0	4	8		No	Yes	
56	Buffalo Lake	Parkland	83A/6,7,10,11	08 June	0	0	7	7		Yes	Yes	
26	Camp Lake	Parkland	73E/4	07 June	0	0	0.75	3.2		No	Yes	
29	Carrier Lake	Parkland	73E/4	13 June	0	0	2.2	4.8		No	Yes	
92	Chain Lake 8	Parkland	82P/16	12 June	0	0	0	0	(d)	Yes	Yes	
17	Christopher Lake	Parkland	73E/16	06 June	0	0	3	6.4		No	Yes	
57	Cipher Lake	Parkland	73D/9	06 June	0	0	1.5	4.8		Yes	Yes	
61	Dillberry Lake	Parkland	73D/9	13 June	0	0	2.5	3.5		No	Yes	
22	Geneva Lake	Parkland	73E/6	08 June	0	0	1	2.5		No	No	
62	Gillespie Lake	Parkland	73D/8	06 June	0	0	1.17	17	L (d)	Yes	Yes	
81	Goosequill Lake	Parkland	83A/3	12 June	0	0	9.3	10	L	Yes	Yes	
47	Gull Lake	Parkland	83A/5,12; 83B/8,9	14 June	0	0	6.33	40	H	No	Yes	
63	Hansman Lake	Parkland	73D/8	07 June	3	6	4	4		No	No	
34	Hattie Lake	Parkland	73D/13	04 June	0	0	1	4.8		No	Yes	
66	Horseshoe Lake	Parkland	73D/7	14 June	0	0	6	11		Yes	Yes	
80	Hummock Lake	Parkland	83A/3	13 June	0	0	6.25	6	L	No	Yes	
52	Jacknife (Stinky) Lake	Parkland	83A/7	13 June	0	0	1.25	2.4		Yes	Yes	
20	Junction Lake	Parkland	73E/5	04 June	0	0	2	4	H	No	Yes	
59	Killarney Lake	Parkland	73D/9	04 June	1	2	6.5	15	(d)	Yes	Yes	
32	Lac Desroches	Parkland	73E/4	04 June	0	0	0.95	3.2		No	Yes	
21	Lac Emilien	Parkland	73E/11	08 June	0	0	1	2.5		No	No	
30	Lac Letendre	Parkland	73E/4	06 June	0	0	2	3		No	Yes	
51	Lake 13 (Oberg)	Parkland	83A/10	13 June	0	0	3	6	L	No	Yes	

## 2001 Piping Plover Census

Table 1 Results of 2001 International Piping Plover Breeding Census in Alberta (cont.)

Map #	Site	Region	1:50,000 NTS Map Sheet(s)	Date	2001 census				Water level <sup>b</sup>	91 census	96 census
					No. of pairs	No. of adults	Person hours	Distance surveyed (km)			
9	Long Lake (Vermilion River)	Parkland	73E/16	01 July	0	0	3.5	4		No	No
79	Lowden Lake	Parkland	83A/2	04 June	0	0	3.75	7.5		Yes	Yes
49	Messner Pond	Parkland	83A/10	11 June	0	0	7	10	S	Yes	Yes
64	Metiskow Lake	Parkland	73D/7	03 June	0	0	2.5	2.5		Yes	Yes
43	Miquelon Lake #1	Parkland	83H/2	07 June	0	0	2	2		No	Yes
44	Miquelon Lake #2	Parkland	83H/2	07 June	0	0	5.5	7	L	Yes	Yes
42	Miquelon Lake #3	Parkland	83H/2,7	13 June	0	0	12.75	30		Yes	Yes
60	NW Killarney Lake	Parkland	73D/9	04 June	0	0	1.5	4		No	Yes
31	Oliva Lake	Parkland	73E/4	11 June	0	0	1.25	4		No	Yes
67	Piper Lake	Parkland	73D/7	03 June	1	2	1.5	2		Yes	Yes
18	Plain Lake	Parkland	73E/12	08 June	5	13	3.75	12		No	No
46	Red Deer Lake	Parkland	83A/10,11,14	08 June	1	3	41	25.6	L	No	Yes
53	Rider Lake	Parkland	83A/10	05 June	0	0	7.5	9.6	L	Yes	Yes
50	Rockeling Bay	Parkland	83A/10	12 June	0	0	2	6.4	L	Yes	Yes
48	Sittingstone Lake	Parkland	83A/10	12 June	0	0	2.5	4		No	No
83	Spiers Lake	Parkland	82P/16	12 June	0	0	8	7	L	Yes	Yes
82	Sullivan Lake	Parkland	72M/13; 73D/4; 82P/16; 83A/1	13 June	0	0	5.5	20		No	Yes
65	Sunken Lake	Parkland	73D/7	03 June	3	6	4	5		Yes	Yes
28	Thomas Lake	Parkland	73E/4	07 June	0	0	11	15	S	No	Yes
16	Unnamed (1 km NW Meridian L.)	Parkland	73E/16	11 June	0	0	1.5	3		No	No
36	Unnamed (7 km SE Irma)	Parkland	73D/14	04 June	0	0	1.5	2	(d)	No	Yes

Table 1 Results of 2001 International Piping Plover Breeding Census in Alberta (cont.)

Map #	Site	Region	1:50,000 NTS Map Sheet(s)	Date	2001 census				Water level <sup>b</sup>	91 census	96 census
					No. of pairs	No. of adults	Person hours	Distance surveyed (km)			
55	Unnamed (Bar Harbour Bible Camp)	Parkland	83A/7	15 June	0	0	0.33	0.8	L (d)	No	Yes
54	Unnamed (E of Buffalo L.)	Parkland	83A/7	15 June	0	0	0.2	1		No	Yes
69	Unnamed (SE of Capt. Eyre L.)	Parkland	73D/7	05 June	2	5	2.25	5.5		No	No
33	Vernon Lake	Parkland	73D/13,14	04 June	0	0	2.83	10		No	Yes
58	West Reflex Lake	Parkland	73D/9	07 June	12	31	13.5	5		Yes	Yes
35	Whitewater Lake	Parkland	73D/13	12 June	0	0	0.25	1.5	L (d)	No	Yes
123	Chappice Lake	Prairie	72L/1	08 June	0	0	3.33	5.6		Yes	Yes
120	Keho Lake	Prairie	82H/14,15	06 June	0	0	3.4	22.4	H	Yes	Yes
118	McGregor Lake	Prairie	82I/7,10	08 June	0	0	21.25	62	L	No	Yes
126	Reesor Lake	Prairie	72E/9	06 June	0	0	4	3		No	Yes
124	Sam Lake	Prairie	72L/1	14 June	0	0	4	5.6		Yes	Yes
122	Shanks Lake	Prairie	82H/2	07 June	0	0	5.5	8	L	No	Yes
121	St. Mary Reservoir	Prairie	82H/6	11,14, 17 June	0	2	12	30.4	L	No	Yes
125	Unnamed (SE of Sam L.)	Prairie	72L/1	14 June	0	0	2	3.2		Yes	Yes
Totals					60	150	586.1	917.7			

<sup>b</sup> Water level is relative to 1996 level. L=Lower; S=Same; H=Higher. (d) denotes dry lake in 2001.

## 2001 Piping Plover Census

Table 2. Comparison of Piping Plover populations on lakes surveyed in 2001 with previous provincial census.

Lake	Region	Total # birds				Numerical change		
		1986 <sup>a</sup>	1991	1996	2001 <sup>a</sup>	1986-2001	1991-2001	1996-2001
Chappice Lake	Prairie		2	1	0	-17	-2	-1
Keho Lake	Prairie		3	1	0		-3	-1
McGregor Lake	Prairie			0	0			0
Reesor Lake	Prairie			0	0			0
Sam Lake	Prairie	6+	4	2	0	-6	-4	-2
Shanks Lake	Prairie			0	0			0
St. Mary Reservoir	Prairie			3	2			-1
Unnamed (SE of Sam L.)	Prairie	1	0	0	0	-1	0	0
Antelope Lakes	Bow			0	0			
Chain Lake #1 (Pearl Lake)	Bow	0	2	0	4	0	2	4
Chain Lake #2	Bow	0			0	0		
Chain Lake #3 (Clear Lake)	Bow	1	2	0	0	-1	-2	0
Chain Lake #3A	Bow	0	0	0	0	0	0	0
Chain Lake #4	Bow	12	5	13	5	-7	0	-8
Chain Lake #5	Bow	0		0	0	0		0
Chain Lake #6	Bow	1	2	0	0	-1	-2	0
Chain Lake #7	Bow	0	0	0	0	0	0	0
Chestermere Lake	Bow			0	0			0
Cochrane Lake	Bow			0	0			0
Dowling Lake	Bow	18	21	54	4	-12	-17	-50
Dragon Lake	Bow	0			0	0		
Eagle Lake	Bow	(0)		0	0	0		0
Foster Lake <sup>b</sup>	Bow	6		2	4	-2		2
Frank Lake	Bow	0		0	0	0		0
Gooseberry Lake	Bow	4	9	0	0	-4	-9	0
Greenlee Lake	Bow	3	4	2	0	-3	-4	-2
Handhills Lake	Bow	37	20	54	9	-28	-11	-45
Janet Lake	Bow			0	0			0
Lake Newell	Bow	3+	1	0	0	-3	-1	0
Little Fish Lake	Bow	23	19	0	3	-20	-16	3
Long Lake <sup>c</sup>	Bow	1		0	0	-1		0
Majors Lake	Bow			0	(0)			0
McDonald Lake	Bow	0	0	0	0	0	0	0
Mudspring Lake	Bow			0	0			0
Namaka Lake	Bow	0		0	0	0		0
Neutral Hills A	Bow	12	2	0	0	-12	-2	0
Neutral Hills B1	Bow	4	0	2	0	-4	0	-2
Neutral Hills B2	Bow	0	0	0	0	0	0	0
Neutral Hills C1	Bow	6	5	5	0	-6	-5	-5
Plover Lake	Bow	(0)		0	6	6		6
Salt Lake Reservoir	Bow			0	0			0
Sounding Lake	Bow	18	0	2	(0)	-18	-18	-16
Akasu Lake	Parkland			10	2			-8
Albert Lake	Parkland			2	6			4
Alice Lake	Parkland			0	0			0

# 2001 Piping Plover Census

Table 2. Comparison of Piping Plover populations on lakes surveyed in 2001 with previous provincial census.

Lake	Region	Total # birds				Numerical change		
		1986 <sup>a</sup>	1991	1996	2001 <sup>a</sup>	1986-2001	1991-2001	1996-2001
Baxter Lake	Parkland	0	2	2	6	6	4	4
Beaverhill Lake	Parkland	0		13	0	0		-13
Birch Lake (Main basin)	Parkland			14	7			-7
Birch Lake (N basin)	Parkland			5	0			-5
Bittern Lake	Parkland	0		2	0	0		-2
Buffalo Lake	Parkland	2	0	0	0	-2	0	0
Camp Lake	Parkland			0	0			0
Carrier Lake	Parkland			0	0			0
Chain Lake #8	Parkland		0	0	0		0	0
Christopher Lake	Parkland			0	0			0
Cipher Lake	Parkland	4	4	4	0	-4	-4	-4
Dillberry Lake	Parkland	0		0	0	0		0
Gillespie Lake	Parkland	0	0	0	0	0	0	0
Goosequill Lake	Parkland	2	0	0	0	-2	0	0
Gull Lake	Parkland	0		0	0			0
Hansman Lake	Parkland	0			6	6		
Hattie Lake	Parkland	(0)		0	0	0		0
Horseshoe Lake	Parkland	2	0	6	0	-2	0	-6
Hummock Lake	Parkland			0	0			0
Jackknife (Stinky) Lake	Parkland		0	0	0		0	0
Joseph Lake	Parkland			0	(0)			0
Junction Lake	Parkland			2	0			-2
Killarney Lake	Parkland	0	22	23	2	2	-20	-21
Lac Desroches	Parkland			0	0			0
Lac Letendre	Parkland			0	0			0
Lake 13 (Oberg)	Parkland	0		0	0	0		0
Leane Lake	Parkland	0	2	1	2	2	0	1
Lonepine Lake	Parkland	0	0	0	(0)	0	0	0
Lowden Lake	Parkland	0	0	0	0	0	0	0
Messner Pond	Parkland		0	0	0		0	0
Metiskow Lake	Parkland		2	2	0		-2	-2
Miquelon Lake #1	Parkland			1	0			-1
Miquelon Lake #2	Parkland	0	0	0	0	0	0	0
Miquelon Lake #3	Parkland		0	0	0		0	0
N.W. Killarney Lake	Parkland			2	0			-2
Oliva Lake	Parkland			0	0			0
Oliver Lake	Parkland	0		0	(0)			0
Piper Lake	Parkland	15+	12	6	2	-13	-10	-4
Red Deer Lake	Parkland	(0)		2	3	3		1
Rider Lake	Parkland	15	7	0	0	-15	-7	0
Rockeling Bay	Parkland	18	6	0	0	-18	-6	0
Spiers Lake	Parkland	6	2	0	0	-6	-2	0
Sullivan Lake	Parkland	0		0	0	0		0
Sunken Lake	Parkland	5+	8	7	6	1	-2	-1
Thomas Lake	Parkland			0	0			0



Table 2. Comparison of Piping Plover populations on lakes surveyed in 2001 with previous provincial census.

Lake	Region	Total # birds				Numerical change		
		1986 <sup>a</sup>	1991	1996	2001 <sup>a</sup>	1986-2001	1991-2001	1996-2001
Unnamed (7 km SE Irma)	Parkland			0	0			0
Unnamed (Bar Harbour Bible Camp)	Parkland			0	0			0
Unnamed (E of Buffalo L.)	Parkland			0	0			0
Vernon Lake	Parkland	(0)		0	0	0		0
West Reflex Lake <sup>d</sup>	Parkland	46+	12	19	31	-15	19	12
Whitewater Lake	Parkland			0	0			0
Wilkins Lake	Parkland			0	(0)			0
Bunder Lake	Northeast Boreal			0	(0)			0
Floatingstone Lake	Northeast Boreal			0	(0)			0
Garnier Lakes	Northeast Boreal			0	0			0
Lac Brosseau	Northeast Boreal			0	(0)			0
Lac St. Cyr	Northeast Boreal			0	(0)			0
Lake Eliza	Northeast Boreal			0	(0)			0
Lower Therien Lake	Northeast Boreal			0	0			0
Muriel Lake	Northeast Boreal			17	19			2
Reed Lake	Northeast Boreal			0	0			0
Reita Lake	Northeast Boreal				0			
Wasagamu Lake	Northeast Boreal				0			

a (0) indicates that lake not surveyed from the ground, but populations assumed to be 0 because of lack of suitable habitat

b Foster Lake referred to as "Unnamed lake north of Sounding Lake (31-37-W4)" by Wershler and Wallis (1987).

c Long Lake referred to as "Large pond east of Bruce Lake (9-26-25-W4)" by Wershler and Wallis (1987).

d Numbers are for Alberta side of West Reflex Lake only.

Table 3. Locations of banded Piping Plovers observed in Alberta, 2001.

Initial Banding			No of observed	
Location	Year	Age	PIPL	Resighting Location
West Reflex Lake	2001	AHY	3	West Reflex Lake
Handhills	2001	AHY	2	Handhills
Chain Lake #4	1999	L	1	Akasu Lake
Sunken Lake	1999	L	1	West Reflex Lake
Unknown	Unknown	Unknown	2	Plain
Unknown	Unknown	Unknown	1	Albert
Unknown	Unknown	Unknown	3	West Reflex Lake
Texas	Late 1990's	AHY	1	Chain Lake #4
Total			14	

AHY = after hatch year

L = local

Table 4. Frequency of potential threats to Piping Plover habitat on surveyed lakes in Alberta, and on individual patches of habitat (beaches) identified on surveyed lakes.

Potential Threat	Lakes		Beaches	
	all (n=86)	with plovers (n=23)	All (n=365)	with plovers (n=45)
Cattle Grazing	57 (66.3%)	16 (69.6 %)	175 (47.9%)	18 (40.0%)
Industrial Activities	3 (3.5 %)	0 (0.0 %)	4 (1.1%)	0
Motorized Vehicles	16 (18.6 %)	8 (34.8 %)	30 (8.2%)	4 (8.9%)
Petroleum Exploration/Extraction	6 (7.0%)	3 (13.0 %)	6 (1.6%)	0
Recreational/Residential Use	11 (12.8 %)	6 (26.1%)	20 (5.5%)	3 (6.7%)
Vegetation Encroachment	36 (41.9%)	12 (52.2 %)	95 (26.0%)	12 (26.7%)
Water Management	7 (8.1%)	2 (8.7 %)	22 (6.0%)	0

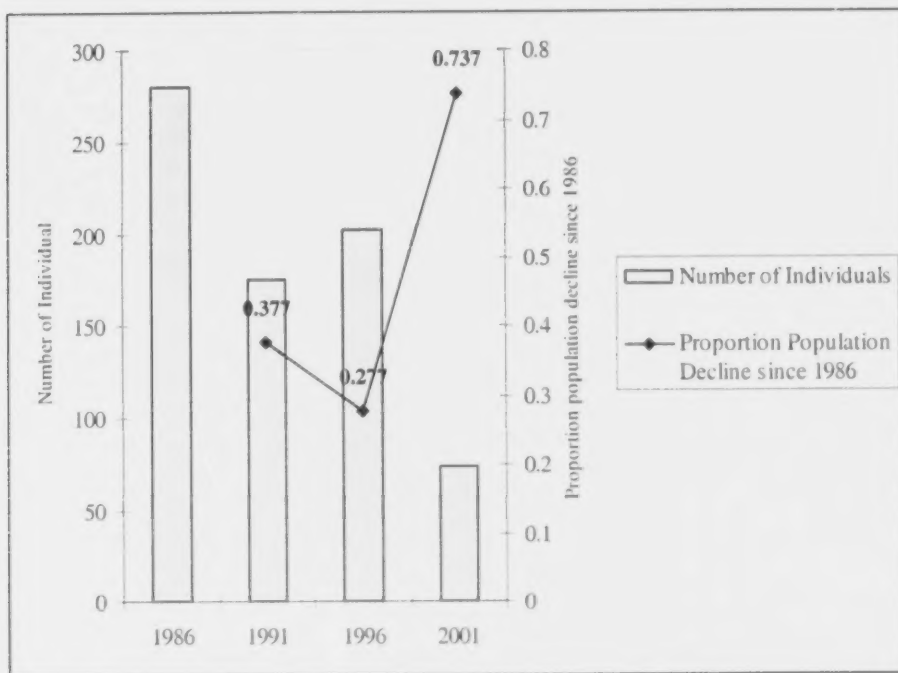


Figure 2. Piping Plover population decline on Alberta Lakes, 1986-2001.

## Conservation of the Piping Plover in Canada

Diane L. Amirault

*Canadian Wildlife Service, Atlantic Region, P.O. Box 6227, Sackville, New Brunswick E4L 1G6*

### The 2001 International Census

There are few other species that have been more completely and regularly censused than the Piping Plover. The International Census conducted in 2001 provided the third range-wide data source, contributing significantly to an increased understanding of the hemispheric population dynamics. In addition to these five-year censuses, many North American jurisdictions now routinely conduct annual surveys. These efforts provide much needed information for evaluating the success of conservation programs. Repeated and consistent surveys completed over a wide range are also useful in detecting local and regional shifts in abundance. These shifts in distribution can often be correlated with changes in habitat characteristics, as well as in response to new or enhanced conservation efforts.

In comparison with the two previous surveys, the North American population estimate has increased slightly (+0.2%) to the current estimate of 5945 adults, compared to 5484 in 1991 and 5931 in 1996 (Table 1). Census results therefore suggest that the North American population is stable overall. The fact that the population appears to be stable is still not cause for complacency due to the substantive amount of conservation and restoration efforts expended. Agencies have aimed to increasing populations, however these efforts have had limited success as evidenced by lack of increases. Conservation efforts are critical to even the maintenance of existing populations.

Table 1. International Piping Plover Breeding Census results, 1991-2001.

	1991	1996	2001	1991-2001 Comparison	1996-2001 Comparison
<i>Canada</i>					
<i>Prairie Canada</i>	1437	1687	172	-32%	-42%
Alberta	180	276	150	-17%	-46%
Saskatchewan	1172	1348	805	-31%	-40%
Manitoba	80	60	16	-80%	-73%
Ontario	5	3	1	-80%	-67%
<i>Great Lakes</i>					
Ontario	0	1	1	100.0%	0.0%
<i>Eastern Canada</i>	509	422	481	-5%	14%
Newfoundland	7	27	39	457%	44%
Québec	76	104	70	-8%	-33%
Prince Edward Island	110	66	112	2%	70%
New Brunswick	203	146	167	-18%	14%
Nova Scotia	113	79	93	-18%	18%
<i>France</i>					
St. Pierre et Miquelon	4	6	9	125.0%	50.0%

## 2001 Piping Plover Census

<i>United States</i>					
<b><i>U.S. Northern Great Plains</i></b>	<b>2032</b>	<b>1599</b>	<b>1981</b>	<b>-2.5%</b>	<b>23.9%</b>
Minnesota	13	10	7	-46.2%	-30.0%
Montana	308	153	137	-55.5%	-10.5%
North Dakota	992	1004	1112	12.1%	10.8%
South Dakota	295	29	390	32.2%	1244.8%
Nebraska	398	375	308	-22.6%	-17.9%
Iowa	13	14	11	-15.4%	-21.4%
Kansas	0	1	3	300.0%	200.0%
Colorado	13	13	13	0.0%	0.0%
Oklahoma	0	nc	nc	n/a	n/a
<b><i>Great Lakes</i></b>	<b>40</b>	<b>47</b>	<b>71</b>	<b>77.5%</b>	<b>51.1%</b>
Michigan	39	47	65	66.7%	38.3%
Wisconsin	1	0	6	500.0%	600.0%
IL/IN/OH/PA/NY	nc	nc	0	n/a	n/a
<b><i>U.S. Atlantic</i></b>	<b>1462</b>	<b>2169</b>	<b>2430</b>	<b>66.2%</b>	<b>12.0%</b>
Maine	38	114	96	152.6%	-15.8%
New Hampshire	nc	nc	14	n/a	n/a
Massachusetts	293	877	962	228.3%	9.7%
Rhode Island	47	91	93	97.9%	2.2%
Connecticut	67	42	45	-32.8%	7.1%
New York	334	493	624	86.8%	26.6%
New Jersey	280	225	228	-18.6%	1.3%
Delaware	10	8	10	0.0%	25.0%
Maryland	35	91	112	220.0%	23.1%
Virginia	270	155	198	-26.7%	27.7%
North Carolina	86	73	48	-44.2%	-34.2%
South Carolina	2	0	0	-100.0%	0.0%
<b><i>Totals</i></b>					
<b><i>Canada</i></b>	<b>1946</b>	<b>2110</b>	<b>1454</b>	<b>-25%</b>	<b>-31%</b>
<b><i>France</i></b>	<b>4</b>	<b>6</b>	<b>9</b>	<b>125.0%</b>	<b>50.0%</b>
<b><i>United States</i></b>	<b>3534</b>	<b>3815</b>	<b>4482</b>	<b>26.8%</b>	<b>17.5%</b>
<b>GRAND TOTALS</b>	<b>5484</b>	<b>5931</b>	<b>5945</b>	<b>8.4%</b>	<b>0.2%</b>

nc = no census

While the number of birds counted has been stable to perhaps a slight increase during 1991-2001, not all of the positive trend may be attributed to a population increase. Survey effort and the proportion of birds present that are counted has increased. With each successive survey, fewer new habitats may be identified and greater proficiency in survey techniques may lead to greater survey precision.

End of season counts consistently yield higher nesting population estimates than those derived during the International Census period. These numbers provide a useful comparison to the census estimates but are not conducted systematically and the possibility of double-counting adults exists. Therefore, the International Census continues to serve a useful purpose as a conservative, consistent measure of the nesting population in North America.

Only a small proportion of Piping Plovers have been located during wintering ground counts (Ferland and Haig 2002). Fewer wintering birds were counted in 2001 compared to previous surveys

(3384 and 2515 individuals in 1991 and 1996, respectively). A total of 2389 birds or approximately 40% of the estimated breeding population was counted during the winter census of 2001. This may be cause for concern considering the increase in development and other recreational pressures that may be present in Piping Plover habitat. Since the wintering location of the majority of the breeding population is unknown, it is currently impossible to identify conservation needs and implement protection efforts for important wintering sites. A more complete report on the results of the wintering ground census has been compiled in Ferland and Haig (2002).

### Canadian population trends and current status

Overall, the Canadian population in 2001 declined sharply from the estimates derived in 1991 and 1996. The Canadian population is now estimated at 1454 adults, a decline from 1946 adults in 1991 (-25%) and from 2110 adults in 1996 (-31%) (Table 2). The most dramatic decline was reported for the Prairie population. Although the Prairie population continues to contain the majority of the Canadian birds, the proportion of adults found here declined from approximately 74% in 1996 to 67% in 2001. The large decrease in number of adults counted in the prairies may in part be due to a shift in distribution related to habitat availability in parts of the Northern Great Plains, however the overall trend in numbers for this population is a decline over the three census efforts of -10%. All Prairie jurisdictions experienced a reduction in the number of adults since 1991, with the greatest decline in Manitoba and Ontario.

Only two Eastern Canada jurisdictions reported an increase between 1996 and 2001. The increase in number of birds counted in Newfoundland is due in part to an increase in survey effort. The increase in Prince Edward Island represented a very marginal increase of only two additional adults. The three other provinces reported lower numbers overall since 1991, however the number of adults has generally increased since 1996 with the exception of Québec. The Eastern Canada population decreased slightly (-5%) between 1991 and 2001, however the major decline during this period appears to have occurred from 1991 to 1996.

The status of the Canadian population was re-evaluated by the Committee on the Status of Endangered Wildlife (COSEWIC) in Canada in 2001 (Boyne 2001). The COSEWIC deliberations confirmed that the species remains "Endangered" in Canada, however the status listing now reflects the presence of two subspecies in the country, with the *C. melodus melodus* (Eastern Canada) and *C. melodus circumcinctus* (Prairie Canada) being listed independently. The separation of the two populations reflects the biological and conservation situation in Canada since there appears to be little exchange between the two populations, and many of the threats and conservation approaches are different. However, joint conservation efforts in terms of information sharing and planning continue to be pursued between the two populations and in cooperation with United States recovery teams. Both Canadian Recovery Teams continue to implement conservation programs as population recovery objectives identified in the National Piping Plover Recovery Plan (Goossen *et al.* 2002) have yet to be achieved.

### Conservation programs and priorities

The Species at Risk Act (SARA) was adopted in 2003, prohibitions came into force in 2004. This legislation will result in an enhanced level of protection for the species on federal lands and will facilitate protection outside of federal lands through the establishment of provincial bilateral agreements. All Canadian jurisdictions with Piping Plovers also now have species at risk legislation and have either identified the Piping Plover as endangered or are in the process of evaluating its status. Most provinces also have provisions within this legislation for the protection of critical or otherwise designated important habitat.

A complementary program, the Habitat Stewardship Program, provides funding to support non-governmental participation in the recovery process. In Eastern Canada, there are now Guardian programs

operating in all provinces so that the majority of Piping Plover habitat is provided with some level of protection. In Prairie Canada, only Manitoba has had guardian activity.

There is a continued focus of conservation activities on reducing disturbance, mortality and predation of eggs and young. Reduction of disturbance will be achieved using educational tools and programs such as signs, symbolic fencing, beach guardians, beach closures, and stewardship. Reducing destruction of eggs and mortality of young will be approached by using exclosures, predator removal and promoting appropriate water management regimes in nesting habitat. All of these efforts must continue in the foreseeable future in order to have a chance of achieving population recovery goals. Additional efforts will need to be developed and implemented in order to reverse the negative trend in population numbers observed during the last census. Some of the actions that could result in a reversal of trends include:

- Identification and protection of critical habitat in Canada;
- Predator management;
- Ongoing research programs to provide a sound scientific basis for recovery programs, particularly in the following areas where information is lacking:
  - Locating areas used for wintering and migration;
  - Documenting migratory and wintering behaviour;
  - Identifying and addressing threats operating on the wintering grounds and during migration.
- Continuation of International Census efforts to periodically and systematically assess the status of the global population.

On a continental level, recovery programs that have been initiated in most jurisdictions with Piping Plovers across North America must be continued. An effort must also be made to find new approaches to recovery that may provide long-term conservation benefits. Exploring options for controlling and managing predators would be of particular benefit. One area which has been largely ignored until very recently is the significance of identifying and protecting wintering areas. Preliminary information obtained through banding studies focused on several populations appear to strongly suggest that Piping Plovers exhibit high site fidelity to wintering areas both within and between seasons. Many known wintering sites have been identified as critical habitat under the US Endangered Species Act, however receive only weak habitat protection. Protection of key sites must be enhanced to ensure that protection measures complement conservation principles applied on the breeding grounds and increase the potential for achieving recovery objectives.

The status of the Piping Plover in Canada has not significantly improved since the last International Census despite considerable conservation effort. This indicates a need for continued and possibly increased attention to the species' needs throughout its annual cycle. The future of the Piping Plover is not completely bleak. As outlined in this document, agencies continue to conduct relevant monitoring and research activities aimed at better understanding the population dynamics and needs of the species. Conservation programs are now implemented in many key breeding areas and successes at a local scale are frequently reported. For the time being, the status of the Piping Plover remains precarious however the dedication of agencies working across North America for the protection of the species allows cautious optimism for the survival of the species.



## Literature Cited

- Alberta Agriculture, Food and Rural Development. 2001. Alberta agricultural weather summary. <http://www.agric.gov.ab.ca/navigation/sustain/climate/index.html>.
- Amirault, D. 2001. Canadian Wildlife Service – Atlantic Region, 2001 Piping Plover Recovery Activities Report. Unpublished Canadian Wildlife Service Report. 7 pp.
- Bjorge, R. 1997. The 1996 International Piping Plover Census in Alberta. Pp. 158-163 in 1996 International Piping Plover Census (J. H. Plissner and S. M. Haig, eds.). U. S. Geological Survey-Biological Resources Division, Corvallis, OR. 231 pp.
- Bjorge, R. R., and A. J. Murphy. 2004. The 1996 Piping Plover census in Alberta. Pgs. 117-139. In J.P. Goossen and D.L. Amirault (editors). 2004. The 1996 International Piping Plover Census in Canada. Technical Report Series No. 416. Canadian Wildlife Service, Edmonton, Alberta and Sackville, New Brunswick. 164 pp.
- Boates, S. 1996. The 1996 International Piping Plover Breeding Census in Nova Scotia. in Plissner, J.H & Haig, S.M. (eds.) 1996 International Piping Plover Census. pp. 94 – 99.
- Boyne, A.W. 2001. Update COSEWIC status report on the Piping Plover *Charadrius melodus* in Canada. Report to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Ottawa.
- Brazil, J., E. Menchenton, and R. Etcheberry. 1996. The 1996 Piping Plover census in Newfoundland and St-Pierre-et-Miquelon (France). In Goossen, J.P. and D.L. Amirault (eds). 2004. The 1996 International Piping Plover Census in Canada. Technical Report Series No. 416. Canadian Wildlife Service, Edmonton, Alberta and Sackville, New Brunswick. 164 pp.
- Cadman, M.D., P.F.J. Eagles, and F.M. Helleiner. 1987. Atlas of the breeding birds of Ontario. Univ. of Waterloo Press, Waterloo. 617 pp.
- Cairns, W. E. 1978. The Status of the Piping Plover of Prince Edward Island. Unpublished report, PEI Department of Environment, Charlottetown.
- Cairns, W.E.; I.A. McLaren. 1980. Status of the Piping Plover on the east coast of North America. Am. Birds 34:206-208.
- Chiasson, R., B. Johnson et E. Tremblay. 1994. The 1991 Piping Plover census in New Brunswick, Pp.20-23 dans S.P. Flemming éd. The 1991 International Piping Plover Census in Canada. Occasional Paper No 82. Environnement Canada, Service canadien de la faune. 59p.
- Corbett, G. N. 1988. Summary Report Status of Piping Plover in Canada's National Parks. Unpublished report, Canadian Parks Service.
- COSEPAC. 2001. Espèces canadiennes en péril, novembre 2001. Comité sur la situation des espèces en péril au Canada. 36p.

- COSEWIC. 2001. Canadian species at risk, May 2001. Committee on the Status of Endangered Wildlife in Canada, Ottawa, ON. 31 pp.
- Deblinger, R.D., J.J. Vaske, and D.W. Rimmer. 1992. An evaluation of different predator exclosures used to protect Atlantic coast piping plover nests. *Wildlife Society Bulletin*, 20 : 274-279.
- Demers, A. et P. Laporte. 1988. Inventaire des habitats du Pluvier siffleur sur la Côte-Nord et en Gaspésie. Rapport interne. Service canadien de la faune. 44 p.
- De Smet, K. and B. Koonz. 2002. The 2001 International Piping Plover Breeding Census in Manitoba. In C.L. Ferland and S.M. Haig (eds). 2001 International Piping Plover Census. U.S. Geological Survey, Forest and Rangeland Ecosystem Science Center, Corvallis, Oregon. 293 pp.
- Engley, L. and I. Michaud. 2000. Use of predator exclosures to protect Piping Plover nests in Alberta and Saskatchewan. 2000 Field Season Report. Unpublished report prepared for the Alberta Conservation Association, Edmonton, AB. 18pp.
- Engley, L., and I. Michaud. 2000. Use of predator exclosures to protect Piping Plover nests in Alberta and Saskatchewan. 2000 field season report. Alberta Conservation Association, Edmonton, AB 18 pp.
- Ferland, C. L. and S. M. Haig, 2002. The 2001 International Piping Plover and Snowy Plover Census. Report to USGS Forest and Rangeland Ecosystem Science Center, Corvallis, Oregon. 287 pp.
- Flemming, S. P. 1992. Scientific Review of the Piping Plover Management Program in Prince Edward Island National Park. Unpublished report. Canadian Park Service.
- Flemming, S.P., Chiasson, R.D., Smith, P.C., Austin-Smith, P.J. & Bancroft, R.P. 1988. Piping Plover status in Nova Scotia related to its reproductive and behavioral responses to human disturbance. *J. Field Ornithol.* 59: 321-330.
- Goossen, J.P., D.L. Amirault, J. Arndt, R. Borge, S. Boates, J. Brazil, S. Brechtel, R. Chiasson, G.N. Corgett, R. Curley, M. Elderkin, S.P. Flemming, W. Harris, L. Heyens, D. Hjertaas, M. Huot, B. Johnson, R. Jones, W. Koonz, P. Laporte, D. McAskill, R.I.G. Morrison, S. Richard, F. Shaffer, C. Stewart, L. Swanson and E. Wiltse. 2002. National Recovery Plan for the Piping Plover (*Charadrius melodus*). National Recovery Plan No. 22. Recovery of Nationally Endangered Wildlife. Ottawa. 47 pp.
- Goossen, J. P., S. M. Westworth, B. Yee, D. Thorson, and I. Michaud. 2000. Atlas of Piping Plovers in the Canadian prairie provinces and Ontario. Environment Canada, Edmonton, AB and Regina, SK (multimedia CD-ROM).
- Haig, S.M. 1987. The population biology and life history patterns of the Piping Plover. Ph.D. thesis, University of North Dakota, Grand Forks. 121 pp.
- Haig, S.M. 1992. Piping Plover *Charadrius melodus*. In A. Poole, P. Stettenheim, and F. Gill, eds. The birds of North America, No.2. The Academy of Natural Sciences and the American Ornithologists Union. Philadelphia, Penn, and Washington, D.C.

- Haig, Susan M., and Elliott-Smith, E. (2004). Piping Plover. *The Birds of North America Online*. (A. Poole, Ed.) Ithaca: Cornell Laboratory of Ornithology; Retrieved from The Birds of North American Online database: [http://bna.birds.cornell.edu/BNA/account/Piping\\_Plover/](http://bna.birds.cornell.edu/BNA/account/Piping_Plover/).
- Haig, S.M. and Plissner, J.H. 1992. 1991 International Piping Plover Census. Report to U.S. Fish and Wildlife Service Region 3, Division of Endangered Species, Ft. Snelling, Minnesota. 148pp.
- Haig, S. M. and Plissner, J. H. 1993. Distribution and abundance of Piping Plovers: results and implications of the 1991 international census. *Condor* 95: 145-156.
- Haig, S. M., C. L. Ferland, D. Amirault, F. J. Cuthbert, J. Dingleline, J. P. Goossen, A. Hecht and N. McPhillips. In prep. The importance of complete species censuses and evidence for regional declines in Piping Plovers.
- Haig, S.M. 1985. The status of the Piping Plover in Canada. Report to the Committee on the Status of Endangered Wildlife in Canada. Nat. Mus. Of Natural Sciences, Ottawa. 34pp.
- Haig, S.M. and J. Plissner, J. 1996. Population status of the threatened/endangered Piping Plover in 1991. *International Wader Studies*. 8:39-41.
- Harris, W., G. Wapple, R. Wapple, K. DeSmet and S. Lamont. 1985. Saskatchewan Piping Plovers - 1984. Prepared for Sask. Natural History Society, Saskatoon, SK. 107pp.
- Heckbert, M. D. 1994. Piping Plover (*Charadrius melodus*) ecology and conservation in Alberta (1994): Reflex and Killarney Lake field report. Unpubl. report, Alberta Fish and Wildlife Service, Vermilion, AB. 152 pp.
- Heckbert, M. D., and K. D. Cantelon. 1996. Piping Plover (*Charadrius melodus*) ecology and conservation in Alberta (1995): east-central Alberta field report. Unpubl. report, Alberta Fish and Wildlife Service, Vermilion, AB. 163 pp.
- Helmets, D.L. 1992. Shorebird management manual. Western Hemisphere Shorebird Reserve Network, Manomet, MA. 58pp.
- Heyens, L.E. 1986-88, 1990-01. Internal field survey reports of the Status of the Piping Plover on Sable Islands and Windy Point, Lake of the Woods, Ontario Ministry of Natural Resources.
- Heyens, L.E. 1994. The 1991 Piping Plover Census in Ontario. Occasional Paper Number 82, The 1991 International Piping Plover Census in Canada, edited by Stephen P. Flemming, Canadian Wildlife Service.
- Heyens, L.E. 1996. The 1996 Piping Plover Census in Ontario. Unpublished Report prepared by the Ontario Ministry of Natural Resources for the Canadian Wildlife Service.
- Hofman, D. E. 1993. 1993 Piping Plover survey, Little Fish Lake, Alberta. Unpubl. report, Alberta Fish and Wildlife Division, Red Deer, AB. 8 pp.
- Hofman, D. E. 1994. The 1991 Piping Plover census in Alberta. Pp. 43-47 in *The 1991 International Piping Plover Census in Canada* (S. P. Flemming, ed.). Can. Wildl. Serv. Occas. Paper No. 82. 59 pp.

- Horch, P. 2001. Exciting sightings. Sagebrush Chronicle 12:8
- Johnson, B. C. and P. Feldstein. 1983. Piping Plover Surveys - CWS. Unpublished report, Canadian Wildlife Service, Sackville.
- Koonz, W.H. 1991. The 1991 Piping Plover census in Manitoba. Pp. 32-34 in Flemming, S.P. (ed). 1994. The 1991 International Piping Plover Census in Canada. Canadian Wildlife Service. Occasional Paper No. 82, Ottawa.
- Koonz, W.H. and P.W. Radowski. 1985. Status of colonial waterbirds nesting in southern Manitoba. Canadian Field Naturalist, 99: 12-29.
- Lambert, A.B.; C.J. Risley. 1989. An investigation of the status of the Piping Plover at Lake of the Woods, Ontario. Endangered Species Recovery Fund report. 49 pp.
- Lambert, A.B.; E. Nol. 1978. Status of the Piping Plover at Long Point. Unpublished report prepared by Long Point Bird Observatory for Wildlife Branch, Ontario Ministry of Natural Resources.
- Laporte, P. et F. Shaffer. 1994. Recensement du Pluvier siffleur au Québec, en 1991, Pp.24-29 dans S.P. Flemming éd. 1994. The 1991 International Piping Plover Census in Canada. Occasional Paper No 82. Environnement Canada, Service canadien de la faune. 59p.
- Laporte, P. et F. Shaffer. 2004. Recensement du Pluvier siffleur au Québec, en 1996, Pp. 53-61 dans Goossen, J.P. et D.L. Amirault éd. 2004. The 1991 International Piping Plover Census in Canada. Technical Report Series No. 416. Environnement Canada, Service canadien de la faune. Edmonton, Alberta and Sackville, New Brunswick. 164 p.
- Larson, M. A. 2001. A dissertation presented to the Faculty of the Graduate School, University of Missouri, Columbia.
- Mabee, T.J. and V.B. Estelle. 2000. Assessing the effectiveness of predator exclosures for plovers. Wilson Bulletin, 112(1): 14-20.
- MacDonald, P. (Pers. comm.) Regional Wildlife Biologist, Department of Natural Resources. Tusket, Nova Scotia.
- MacDonald, T., P. McIntyre and J. Waddell. 2001. Island Nature Trust Piping Plover Guardian Program and Prince Edward Island International Breeding Census 2001 Report to World Wildlife Fund Canada. Unpublished report. Island Nature Trust.
- MacLeod, J. 1984. Environment 2000 Survey Report. Unpublished report. Natural History Society of Prince Edward Island.
- Maxson, S.J., K.V. Haws, D.L. Easthouse. 1996. 1996 Status and breeding summary of Piping Plovers and Common Terns at Lake of the Woods, Minnesota. Minnesota Department of Natural Resources internal report, 19 pp.
- McAskill, D. J., B. Hoteling, C. Ristau and S. P. Flemming. 1994. The 1991 Piping Plover Census in Prince Edward Island. Occasional Paper Number 82. Canadian Wildlife Service.

- McCarron, A. (Pers. comm.) Program Coordinator. Nova Scotia Piping Plover Guardian Program. Wellington, Nova Scotia.
- Melvin, S.M., L.H. MacIvor, and C.R. Griffin. 1992. Predator exclosures: a technique to reduce predation at piping plover nests. *Wildlife Society Bulletin*, 20: 143-148.
- Michaud, I. And D. Prescott. 1999. Use of predator exclosures to protect Piping Plover nests in Alberta and Saskatchewan. 1999 Field Season Report. Unpublished report prepared for the Alberta Conservation Association, Edmonton, AB. 19pp.
- Michaud, I., and D. Prescott. 1999. Use of predator exclosures to protect Piping Plover nests in Alberta and Saskatchewan: 1999 field season report. Alberta Conservation Association, Edmonton, AB. 20 pp.
- Miller, A. 2002. Manitoba Piping Plover (*Charadrius melodus*) management plan. Unpublished preliminary report prepared for Manitoba Conservation. 29 pp & append.
- Minnesota Department of Natural Resources (MDNR). 2000. Piping Plover Recovery and monitoring in Minnesota, 2000, Unpublished report submitted to the U.S. Fish and Wildlife Service.
- Morrison, R. I. G. and R. K. Ross. 1989. Atlas of Nearctic shorebirds on the coast of South America. Canadian Wildlife Service Special Publication, 2 volumes, 325 pp.
- Morrison, R. I. G., R. E. Gill, Jr., B. A. Harrington, S. Skagen, G. W. Page, C. L. Gratto-Trevor and S. M. Haig. 2001. Estimates of shorebird populations in North America. Canadian Wildlife Service Occasional Paper No. 104. 64 pp.
- Morrison, R. I. G., R. K. Ross, J. Guzman P. and A. Estrada. 1993. Aerial surveys of Nearctic shorebirds wintering in Mexico: preliminary results of surveys on the Gulf of Mexico and Caribbean coasts. Canadian Wildlife Service Progress Notes No. 206. 14 pp.
- Northcott, P. and L. Creamer. 1987. Survey of Colonial Nesters and Piping Plovers on P.E.I. 1987. Natural History Society of Prince Edward Island.
- Parks Canada. 1997. Conservation of the endangered Piping Plover (*Charadrius melodus*) in Canada's National Parks. Report 007. (ISSN 1200-3298). Halifax, NS: Corbett, G.N.
- Plissner, J. H. and S. M. Haig. 2000. Status of a broadly-distributed endangered species: results and implications of the second International Piping Plover Census. *Canadian Journal of Zoology* 78:128-139.
- Plissner, J. H., and S. M. Haig. 1997. 1996 International Piping Plover Census. U. S. Geological Survey-Biological Resources Division, Corvallis, OR. 231 pp.
- Plissner, J.H. et S.M. Haig. 1997. 1996 International Piping Plover Census. U.S. Geological Survey, Biological Resources Division report. 231 pp.
- Prescott, D. R. C. 1997. Status of the Piping Plover (*Charadrius melodus*) in Alberta. Alberta Wildlife Status Report Series No.1. Alberta Environmental Protection, Edmonton, AB. 19 pp.

- Prescott, D. R. C. 2001. Aerial reconnaissance surveys for Piping Plover habitat in east-central Alberta, May 2001. Alberta Sustainable Resource Development, Fish and Wildlife Division, Alberta Species at Risk Report No. 26, Edmonton, AB.
- Rimmer, D.W. and R.D. Deblinger. 1990. Use of predator exclosures to protect Piping Plover nests. *Journal of Field Ornithology*, 61: 217-223.
- Richardson, I. M. 1999. Predator exclosures: a management technique to increase Piping Plover reproductive success in the Canadian prairies. M.Sc. thesis, University of Alberta, Edmonton, AB. 65 pp.
- Roy, C. 1996. Compte rendu des activités de protection reliées au Pluvier siffleur (*Charadrius melodus*), au Grèbe esclavon (*Podiceps auritus*), à la Sterne de Dougall (*Sterna dougallii*) aux Îles-de-la-Madeleine. Attention Fragiles. 30p.
- Roy, C. 1998a. Rapport sur les activités de protection et de suivi effectuées aux Îles-de-la-Madeleine au cours de l'été 1997. Attention Fragiles. 31p.
- Roy, C. 1998b. Compte rendu des activités de protection reliées au Pluvier siffleur (*Charadrius melodus*) et à la Sterne de Dougall (*Sterna dougallii*) tenues aux Îles-de-la-Madeleine en 1998. Attention Fragiles. 37p.
- Roy, C. et C. Soumagnas. 2000. Compte rendu des activités de protection et de sensibilisation reliées au Pluvier siffleur (*Charadrius melodus*) et à la Sterne de Dougall (*Sterna dougallii*) tenues aux Îles-de-la-Madeleine en 1999. Attention Fragiles. 40p.
- Shaffer, F. et P. Laporte. 1995a. Rapport sur la situation du Pluvier siffleur (*Charadrius melodus*) au Québec. Séries de rapports techniques No 244, Service canadien de la faune, région du Québec, Environnement Canada, Sainte-Foy, viii + 53p.
- Shaffer, F. et P. Laporte. 1995b. Pluvier siffleur, Pp 462-465 dans Gauthier, J. et Y. Aubry (sous la direction de). Les oiseaux nicheurs du Québec : Atlas des oiseaux nicheurs du Québec méridional. Association québécoise des groupes d'ornithologues, Société québécoise de protection des oiseaux, Service canadien de la faune, Environnement Canada, région du Québec, Montréal, xviii + 1295p.
- Skeel, M. 1991. The 1996 International Piping Plover Breeding Census - Saskatchewan. Sask. Natural History Soc. 69pp. + maps.
- Skeel, M. 1996. The 1996 International Piping Plover Breeding Census - Saskatchewan. Sask. Natural History Soc. 43 pp. + maps.
- Smith, A. R. 1996. Atlas of Saskatchewan birds. Nature Saskatchewan, Regina, SK.
- Soumagnas, C. 2001. Rapport sur les activités de protection concernant le Pluvier siffleur (*Charadrius melodus*) et la Sterne de Dougall (*Sterna dougallii*) tenues aux Îles-de-la-Madeleine en 2000. Attention Fragiles. 38p.



- Thomas, L., B. Ashby, V. Docherty, J. Stewart. 2001. Piping Plover Monitoring Program Prince Edward Island National Park of Canada. Unpublished Report. Parks Canada.
- Waddell, J. S. Cole, A. Page and W. Lewis. 2001. Prince Edward Island Piping Plover Atlas (2001 Edition). Unpublished. Island Nature Trust.
- Walker, P. and J. Waddell. 1996. The 1996 International Piping Plover Census in Prince Edward Island. pp 27-41. *in*. Goossen, J.P. and D.L. Amirault (editors). 2004. The 1996 International Piping Plover Census in Canada. Technical Report Series No. 416. Canadian Wildlife Service, Edmonton, Alberta and Sackville, New Brunswick. 164 pp.
- Wershler, C. R., and C. Wallis. 1987. Status of the Piping Plover in Alberta, 1986. Unpubl. report for World Wildlife Fund Canada and Canadian Wildlife Service, Calgary, AB. 54 pp.
- Whyte, A. J. 1985. Breeding ecology of the Piping Plover (*Charadrius melodus*) in central Saskatchewan. M.Sc. thesis, University of Saskatchewan, Regina, SK. 153 pp.



## **Appendix 1**

2001 International Piping Plover Breeding Census Guidelines and Individual Census Report

# INTERNATIONAL PIPING PLOVER COORDINATION GROUP



## 2001 INTERNATIONAL PIPING PLOVER BREEDING CENSUS

### Guidelines

**General Purpose and History:** The International Piping Plover Census, as designated by the International Piping Plover Coordination Group, has been established to provide a complete census of all Piping Plover populations on both wintering and breeding grounds every five years. The 2001 census is the third to be carried out over the past 10 years. The primary function of the census is to gather data for monitoring moderate-to-long-term population trends that will be used to assess success of recovery efforts and recovery objectives. Census data also provide information on the species' range and use of local habitat and may help elucidate migratory patterns. The first International Census, conducted in 1991, provided a population benchmark for the species status and distribution in North America. The breeding census included the efforts of hundreds of individuals in 22 U.S. states, nine Canadian provinces, and the French territory of St. Pierre and Miquelon. During the census period, 5,482 adult Piping Plovers (2,441 pairs) were documented. Subsequently, the 1996 census recorded 5,913 individuals (2,668 breeding pairs), an overall increase of 7.7% from 1991. The 1996 census illustrated some striking regional trends, including a 31% increase in breeding birds along the Atlantic Coast, a 20% increase in the small Great Lakes population, and a 5% decline in the U.S. Great Plains and the Canadian Prairie. The 2001 International Census will complement previous surveys, providing an even more refined picture of the breeding distribution of Piping Plovers. It will also provide the opportunity to assess ten-year trends for the species.

**Census Dates:** Ideally, we would like to have all censuses conducted during the same two weeks across North America, and within a time frame that facilitates comparisons to results obtained in previous surveys. Wherever possible, therefore, we ask that the census be undertaken between June 3<sup>rd</sup> and June 16<sup>th</sup>, 2001 (except for the Atlantic U.S., which will census from May 26<sup>th</sup> thru June 3<sup>rd</sup>). If that is not possible, successive weeks in June are also acceptable. We would appreciate discussing any plans for censuses conducted outside this time period.

**Coordination:** The 2001 census will be directed from USGS Forest and Rangeland Ecosystem Science Center in Corvallis, Oregon via Susan Haig (541-750-7482, email [susan\\_haig@usgs.gov](mailto:susan_haig@usgs.gov)). She will maintain regular contact with other members of the International Piping Plover Coordination Team. Cheron Ferland (541-750-7390, email: [cferland@usgs.gov](mailto:cferland@usgs.gov)) will be the primary coordinator for the census. State/Provincial Coordinators will organize census activities within each state/province and may designate local contact persons or coordinate all censusers directly. The responsibilities of each participant are outlined below:

1. **Census Coordinator:** Susan Haig will identify State/Provincial Coordinators and Cheron Ferland will provide them with census report forms, summary sheets, and assessment forms. Maps will not be distributed with the census information, as in previous censuses. It will be up to each state/provincial coordinator to submit site map(s) and a complete list of latitude and longitude coordinates for each site censused. Susan and Cheron will summarize census information and publicize results of both the winter and breeding censuses by Summer 2002. As in previous years, results will be presented in various formats:
  - a technical paper submitted to a scientific journal
  - a detailed report covering each state/province/country for distribution to recovery teams, state/provincial coordinators, and other natural resource agencies
  - GIS-based maps and datasets posted on appropriate websites
  - a popular article in a national/international birding magazine

---

Susan Haig, Coordinator  
USGS--FRES  
3200 SW Jefferson Way  
Corvallis, OR 97331  
[susan\\_haig@usgs.gov](mailto:susan_haig@usgs.gov)

Nell McPhillips, U.S. Great Plains  
U.S. Fish and Wildlife Service  
420 South Garfield Ave., Suite 400  
Pierre, SD 57501-5408  
[nell\\_mcphillips@fws.gov](mailto:nell_mcphillips@fws.gov)

Jack Dingleline, Great Lakes  
U.S. Fish and Wildlife Service  
2651 Coolidge Road, Suite 101  
East Lansing, MI 48823  
[jack\\_dingleline@fws.gov](mailto:jack_dingleline@fws.gov)

Diane Amirault, Atlantic Canada  
Canadian Wildlife Service  
17 Waterfowl Lane, P.O.B. 6227  
Sackville, New Brunswick E4L 1G6  
[diane.amirault@ec.gc.ca](mailto:diane.amirault@ec.gc.ca)

Paul Goossen, Prairie Canada  
Canadian Wildlife Service  
4999 98th Ave.  
Edmonton, Alberta T6B 2X3  
[paul.goossen@ec.gc.ca](mailto:paul.goossen@ec.gc.ca)

Anne Hecht, U.S. Atlantic  
U.S. Fish and Wildlife Service  
Weir Hill Road  
Sudbury, MA 01779  
[anne\\_hecht@fws.gov](mailto:anne_hecht@fws.gov)

2. **State/Provincial Coordinators:** will identify censusers and areas to be surveyed. They will distribute census materials to individual censusers directly or through local contact persons. Following the census, they will summarize results and ensure that each site is mapped by latitude and longitude and provide a brief assessment of the census in their state/region.

Following completion of the census, Coordinators should send to Cheron Ferland:

- All Individual Census Reports/Maps
- State Summary Sheet
- State Assessment Form

We ask that this information be forwarded to Cheron Ferland by August 15<sup>th</sup>, 2001, and that we be informed of any delays as soon as possible. Maps of census sites should be turned in with the census summary. Each site should contain reference latitude and longitude coordinates (township and range information is not necessary).

3. **Individual Censusers:** will be given census guidelines and a census report form for each site they are to survey. Multiple individuals are encouraged to conduct censuses together. At least one individual censusing each site should be experienced in identification of shorebirds. Whenever possible, censuses of each site should be completed during one day. Multiple censuses of a site are not encouraged unless the original survey is considered to be inaccurate because of adverse weather conditions, human disturbance, etc. Census reports should be filled out as completely as possible for all censuses at each site and returned to the state/provincial coordinator by the specified date. Maps should also be returned to the coordinator with the census area clearly marked and labeled, including latitude and longitude of approximate site center. Specific locations where Piping Plovers are observed may also be indicated on maps. Census reports and maps should be returned even if no Piping Plovers were observed.

Census methods: The goal of the census is to count both breeding pairs and unpaired adults. Pairs should only include birds seen together. Single birds in the presence of nests or young should be tallied separately from other unpaired birds; however, we discourage censusers from searching for nests or young in order to minimize disturbance to breeding sites. We are specifically not addressing issues of reproductive success during this census. We are not providing specific instructions for conducting individual censuses but include the following definitions and suggestions. Sites may include individual wetlands, lakes, or stretches of river or coastline or any portion of the above. Sites should be censused by the most effective means possible. Care should be taken to note where birds have flown to and from in order to avoid double counting. This is especially important because Piping Plovers (in the northern Great Plains and Prairie) often flock when intruders enter a nesting area. Avoid conducting surveys during extreme weather conditions, which not only results in inaccurate census data, but also increases risks of disturbance to the birds. Surveys are best conducted during early morning hours, although we understand that confining censuses to this time period is often unrealistic. Censusers should avoid encroaching on nesting territories when possible and in all cases should limit time spent in any single territory to no more than 5 minutes. Please try to minimize disturbance to the birds!

Census priorities: Ideally, all habitat recently and/or currently suitable for Piping Plovers should be surveyed in 2001. Due to lack of information about sites or other constraints, however, this goal may not be achievable in some states/provinces. To meet census objectives, we therefore suggest the following priorities: 1) Sites that had Piping Plovers present in 1991, 1996 or later. 2) Sites that had suitable Piping Plover habitat in 1991 and 1996. 3) Sites that were unsuitable when censused in 1996 but that have been suitable more recently. 4) Sites not censused in 1996 but that are likely to contain suitable Piping Plover habitat. 5) Sites not censused in 1996 but with historic records of use by Piping Plovers. To most accurately analyze population trends over the past ten years, at least the first three priorities need to be met.

**We thank you for your involvement with the 2001 International Piping Plover Census!**  
**Each census is extremely important in allowing us to monitor recovery efforts for this species.**

# INTERNATIONAL PIPING PLOVER COORDINATION GROUP



## 2001 INTERNATIONAL PIPING PLOVER BREEDING CENSUS

### Individual Census Report

Please complete this form as thoroughly as possible for each location surveyed, even if Piping Plovers are not found. Attach a map or detailed description of the area censused, **including latitude and longitude of survey area** (approximate site center). Also feel free to attach additional comments. These forms should be sent to your State/Provincial Coordinator by

**July 15, 2001.** For further information, contact your State/Provincial Coordinator or Cheron Ferland @USGS-BRD Forest and Rangeland Ecosystem Science Center, 3200 SW Jefferson Way, Corvallis, OR 97331 USA; 541-750-7390; cferland@usgs.gov; FAX 541-758-7761.

1. Total # of pairs of Piping Plovers seen: \_\_\_\_\_  
 Pair criteria used (check all that apply):  
 Courtship behavior \_\_\_\_\_ Pair at nest \_\_\_\_\_ Birds located together \_\_\_\_\_  
 Joint defensive behavior \_\_\_\_\_ Pair with young \_\_\_\_\_ Other (describe) \_\_\_\_\_
2. Total # of unpaired adults: with nest/young: \_\_\_\_\_ no nest/young seen \_\_\_\_\_
3. Census Location:  
 Local name of site: \_\_\_\_\_  
 County: \_\_\_\_\_ State/Province: \_\_\_\_\_  
 Latitude: \_\_\_\_ deg \_\_\_\_ min \_\_\_\_ sec Longitude: \_\_\_\_ deg \_\_\_\_ min \_\_\_\_ sec (approx. center of site)  
 River Miles (Missouri, Niobrara, and Platte Rivers only): \_\_\_\_\_  
 Map(s) (USGS topo quad; atlas/gazetteer grid #; etc.): \_\_\_\_\_  
 Land Ownership: Federal \_\_\_\_\_ State/Provincial \_\_\_\_\_ Municipal \_\_\_\_\_ Private \_\_\_\_\_
4. Date of census: \_\_\_\_\_ Time census conducted: \_\_\_\_\_ to \_\_\_\_\_
5. Conditions:  
 Tide stage(s): Low \_\_\_\_\_ Mid \_\_\_\_\_ High \_\_\_\_\_ (Rising \_\_\_\_\_ / Falling \_\_\_\_\_)  
 General weather: Sunny \_\_\_\_\_ Partly cloudy \_\_\_\_\_ Overcast \_\_\_\_\_ Rain \_\_\_\_\_ Fog \_\_\_\_\_ Other \_\_\_\_\_  
 Approximate temperature: \_\_\_\_\_ Celsius/Fahrenheit (circle one)  
 Wind speed: \_\_\_\_\_ km/hr miles/hr (circle one) Wind direction: \_\_\_\_\_
6. Habitat censused (check as many as apply):  
 Body of Water: I. Ocean \_\_\_\_\_ II. Protected bay, harbor, cove, lagoon \_\_\_\_\_ III. River \_\_\_\_\_  
 IV. Alkali lake/pond \_\_\_\_\_ V. Natural freshwater lake \_\_\_\_\_ VI. Reservoir \_\_\_\_\_  
 VII. Industrial Pond \_\_\_\_\_ VIII. Other (describe) \_\_\_\_\_  
 Shoreline: A. Mainland \_\_\_\_\_ B. Barrier island \_\_\_\_\_ C. Spoil island \_\_\_\_\_ D. Bar \_\_\_\_\_  
 E. Other island \_\_\_\_\_ F. Dry lake bed \_\_\_\_\_ G. Other (describe) \_\_\_\_\_  
 Substrate(s): 1. Sand beach \_\_\_\_\_ 2. Sand spit \_\_\_\_\_ 3. Sand dune \_\_\_\_\_ 4. Sand bar \_\_\_\_\_  
 5. Silt \_\_\_\_\_ 6. Gravel shore \_\_\_\_\_ 7. Gravel bar \_\_\_\_\_ 8. Gravel pit \_\_\_\_\_  
 9. Vegetated shoreline \_\_\_\_\_ 10. Alkali mudflat \_\_\_\_\_ 11. Coastal mudflat \_\_\_\_\_  
 12. Other (describe) \_\_\_\_\_

Susan Haig, Coordinator

USGS--FRESC  
 3200 SW Jefferson Way  
 Corvallis, OR 97331  
[susan\\_haig@usgs.gov](mailto:susan_haig@usgs.gov)

Jack Dingleline, Great Lakes

U.S. Fish and Wildlife Service  
 2651 Coolidge Road, Suite 101  
 East Lansing, MI 48823  
[jack\\_dingleline@fws.gov](mailto:jack_dingleline@fws.gov)

Paul Goossen, Prairie Canada

Canadian Wildlife Service  
 4999 98th Ave  
 Edmonton, Alberta T6B 2X3  
[paul.goossen@ec.gc.ca](mailto:paul.goossen@ec.gc.ca)

Nell McPhillips, U.S. Great Plains

U.S. Fish and Wildlife Service  
 420 South Garfield Ave., Suite 400  
 Pierre, SD 57501-5408  
[nell\\_mcphillips@fws.gov](mailto:nell_mcphillips@fws.gov)

Diane Amirault, Atlantic Canada

Canadian Wildlife Service  
 17 Waterfowl Lane, P.O.B. 6227  
 Sackville, New Brunswick E4L 1G6  
[diane.amirault@ec.gc.ca](mailto:diane.amirault@ec.gc.ca)

Anne Hecht, U.S. Atlantic

U.S. Fish and Wildlife Service  
 Weir Hill Road  
 Sudbury, MA 01779  
[anne\\_hecht@fws.gov](mailto:anne_hecht@fws.gov)

7. Habitat(s) where Piping Plovers found (use above designations; e.g., IIC8, IIIB9):  
\_\_\_\_\_
8. Mode(s) of transportation: Foot \_\_\_ Car/Truck \_\_\_ ATV \_\_\_ Boat \_\_\_ Airboat \_\_\_  
Other \_\_\_\_\_
9. Linear Habitat (shoreline) covered: \_\_\_\_\_ km/miles (circle one)  
Was census completed for this area? yes \_\_\_ no \_\_\_ What percentage was missed? \_\_\_\_\_  
What areas were missed? \_\_\_\_\_
10. Was site censused in 1991? Yes \_\_\_ No \_\_\_  
Was site censused in 1996? Yes \_\_\_ No \_\_\_  
If "yes," how does coverage differ from earlier surveys? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
11. Were there any circumstances that may have affected census results (weather conditions, human disturbance, etc.)?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
12. Band combinations of any marked birds (right leg:left leg from top to bottom; note colors, flags or bands, etc.)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
13. Describe any apparent injuries of banded or unbanded birds. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
14. Number of people censusing: \_\_\_\_\_  
Censusers names, affiliations, phone numbers, email, & addresses: (attach additional list if necessary)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
15. Additional information/comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
16. Return form and maps to: **State/Provincial Coordinator** or **Cheron Ferland**  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
**USGS, FRESC**  
**3200 SW Jefferson Way**  
**Corvallis, OR 97331**  
**USA**  
**541.750.7390**

**THANKS FOR YOUR HELP WITH THE  
2001 INTERNATIONAL PIPING PLOVER CENSUS!**





This document is  
printed on EcoLogo<sup>®</sup>  
certified paper.